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In cooperation with the Alabama Department of Agriculture and Industries

SOIL SURVEY
OF
MONTGOMERY COUNTY, ALABAMA

BY

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By J. F. STROUD, Alabama Department of Agriculture and Industries, in Charge, and W. W. STRIKE, W. E. THARP, B. H. WILLIAMS, and R. T. AVON BURKE, United States Department of Agriculture

COUNTY SURVEYED

Montgomery County is in the south-central part of Alabama. Montgomery, the county seat, is 85 miles from Birmingham on the north and 150 miles from Mobile on the Gulf of Mexico to the south. The Alabama and Tallapoosa Rivers, which form the northern boundary, separate Montgomery County from Autauga and Elmore Counties. The county is roughly rectangular in shape, the greatest north and south dimension being 37 miles and the greatest east and west 33 miles. The total area is 806 square miles, or 515,840 acres.

The surface features of Montgomery County are variable. For convenience in description the county can be divided in four parts, the first and most important division being the so-called "prairie." This occurs in a wide belt crossing the county in a general east-west direction, passing just south of Montgomery and extending to within a short distance of Ramer and Pine Level. The northern half of this division comprises the greater part of what is known as the "black-prairie belt." The surface here is level or gently rolling, the difference in relief between ridges and stream troughs ranging from 20 to 40 feet. The southern half, which comprises the principal areas of the "red prairie" or "post-oak prairie" lands, is somewhat higher and more rolling than the black-prairie belt. Along the southern border of the region the surface is rather badly broken, and in places the land is not suitable for agricultural purposes.

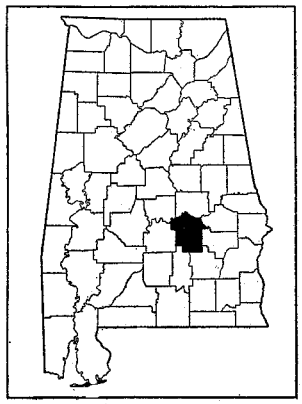


FIGURE 1.—Sketch map showing location of Montgomery County, Ala.

The second division comprises what is known as the "strata ridge." This ridge is a continuation of the Chunnenuggee Ridge of Bullock County. It borders the prairie on the south and forms the divide between streams flowing north and those flowing south. To the north the streams are much lower and have cut back into this ridge at about base level. The result is a very much dissected strip of territory, with local differences in elevation ranging from 75 to 150 feet. To the south the slope is gentle, and the surface in general is fairly level, except in the vicinity of some of the larger streams. Lying along the southern boundary of the county is another strip, somewhat more hilly than the prairie belt and less hilly than the strata ridge belt.

The third division embraces a belt of land which divides the river plains and prairie lands. Beginning near Montgomery this belt, which ranges in width from 2 to 3 miles, extends to the eastern edge of the county. The area around Montgomery is rather broken

and probably is a little higher than the prairie, but farther east the land is more nearly level and appears to be the highest terrace left by Tallapoosa River. About 1 mile west of Antioch in the northwestern part of the county is a remnant of the same terrace with a very rough surface. It is much higher than the adjoining prairie and alluvial lands.

The fourth division includes level or slightly undulating first bottoms or flood plains and smooth second bottoms or terraces, a large development of which occurs along Alabama and Tallapoosa Rivers in the northern part of the county and along the larger streams farther south. At Montgomery, Alabama River has cut back into the highlands but east and west of this point the river plains widen, ranging in width from 2 to 8 miles. A small part of this land constitutes the river flood plains and is subject to annual overflows. The second bottoms are from 15 to 60 feet higher and are no longer subject to overflow, except locally during extremely high floods.

The greatest elevation in the county is in the strata ridge, where the highest points are between 500 and 600 feet above sea level. The average elevation of the prairie is about 300 feet, and the river plains rise from 100 to 200 feet.

Montgomery County has two distinct drainage systems. One includes Alabama and Tallapoosa Rivers, with their tributaries, and affords drainage as far south as the strata ridge. The other consists of the creeks flowing south from this ridge, including Patsaliga, Blue, and Greenbrier Creeks. Alabama River is navigable as far north as Montgomery. Nearly all the county, except the first bottoms and some of the flatter and lower second bottoms, is well drained. In the southern part, particularly on the northern escarpment of strata ridge, the run-off is excessive and erosion is pronounced. Every farm in the county is connected with perennial or intermittent streams, and ditching is necessary only on the flatter bottoms. Terracing to prevent erosion is essential on the rolling and hilly lands and is practiced by nearly all farmers in the rolling country.

Montgomery County was organized in 1816, three years before Alabama was admitted to the Union as a State, but later parts of it were included in Elmore, Bullock, and Crenshaw Counties. The county was named in honor of Maj. Lemuel Putnam Montgomery, a native of Tennessee, who was killed in the fight with the Creek Indians at Horse Shoe Bend, March 27, 1814. The first white settlers came to the present site of the city of Montgomery which, prior to the time of the organization of the county, had been a trading post. As the surrounding country was rich in agricultural resources and was accessible by way of Alabama River, development was rather rapid. By 1821 the town of Montgomery had assumed considerable proportions, by 1835 it had become the most important town in the State, and in 1846 it was selected as the State capital. The surrounding country kept pace with the town in development.

According to the 1920 census, the population of Montgomery County is 80,853, of which 48,463, or 59.9 per cent, are negroes. Only 1 per cent is foreign born. Montgomery, the county seat, has a population of 43,464. All other towns in the county are classed as rural. The most densely populated part of the county is the

northern half, particularly the terraces of Tallapoosa and Alabama Rivers.

In addition to transportation furnished by Alabama River, which connects Montgomery with the port of Mobile, the county is served by six main-line railroads, the Mobile & Ohio, Western Railway of Alabama, Seaboard Air Line, Central of Georgia, Louisville & Nashville, and Atlantic Coast Line, all of which enter the city of Montgomery. The first five roads mentioned serve the northern half of the county and the Atlantic Coast Line runs south through the towns of Snowdoun, Sprague, Ramer, and Grady. A branch of the Atlantic Coast Line extends from Sprague to Luverne in Crenshaw County. All farms in the northern half of the county are within 5 miles of a railroad, but some in the southeastern part are 10 or 12 miles from a station.

Public roads reach all parts of the county. The main highways between the towns and villages are graded and surfaced with gravel. There are about 625 miles of such improved road in the county. Other public roads are kept in fair condition and are good in dry weather, but in wet weather many of them are very muddy and travel is difficult.

Practically all the towns and villages have telephone service, which also reaches many farming communities, especially in the northern half of the county. All parts are reached by rural mail delivery. Besides the excellent schools and colleges in Montgomery, graded schools are maintained in all the towns and villages. Transportation facilities maintained by the county enable students from all sections to reach high schools.

The local towns and villages offer a market for some of the farm produce. Montgomery is the principal market for cotton, cattle, hay, hogs, sheep, beef, and dairy products.

CLIMATE

The climate of Montgomery County is characteristic of regions of moderate elevation in a latitude of 33° N.

The average annual temperature, based on 50 years' observation, is 65.5° F. at Montgomery. The summers are warm, the temperature often exceeding 90° F. between June and September. Frosts and freezing temperatures occur from 10 to 20 times each winter. More than 3 frosts or freezes on successive nights are unusual. The soil is seldom frozen to a depth of more than 1 inch, and it generally thaws out during the day. These freezes or frosts are usually followed by several sunshiny days characterized by brisk winds, high pressure, and rising temperatures, followed in turn by increasing cloudiness, warmth, and local or general rains. Freezes are generally welcomed, as it is believed they lessen the ravages of the boll weevil and other insect pests. Snow is rare, and several years may pass with no snowfall.

The rainfall is ample for all crops and is usually well distributed. September, October, and November are the driest months. The winter season is the wettest.

The average length of the frost-free season is 247 days, from March 10 to November 12, inclusive. The date of the latest recorded frost is April 5 and of the earliest is October 21. The frost-free season is always amply long to ripen all staple crops. Sugarcane and late-

planted sweetpotatoes, where grown on low ground, may sometimes be nipped by fall frosts, but the damage is usually slight. In some years frosts do not occur before Christmas, and pastures remain green. Dallis grass, carpet grass, bur clover, and white clover usually remain green throughout the winter, but Bermuda grass becomes brown and remains so until late in the spring. The more frost-resistant plants, such as onions, collards, cabbage, and radishes, remain green throughout the winter, as do also rape, oats, and rye. Such crops usually make a slow growth, unless given a good start by early fall planting. Freezes are sometimes injurious, but winter injury to garden vegetables is usually preventable if the crops are covered with pine straw.

High winds are rare and do little damage. The average annual wind movement is only 5 miles an hour, the greatest velocity occurring in spring and the least in midsummer. Prevailing winds are from the north in winter, from the south in spring, from the northwest in summer, and from the northeast in fall. Summer days are often sultry, but the nights are cooled by breezes.

Water for domestic use is pure and easily obtained. Montgomery is said to be the largest city known to obtain its municipal water supply from deep artesian wells. In the prairie region water is secured from deep drilled wells, which penetrate the Selma chalk formation. In the sandy lands region, wells from 20 to 50 feet deep usually supply water of desirable quality.

Table 1 gives the normal monthly, seasonal, and annual temperature and precipitation at Montgomery, as recorded by the Weather Bureau.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Montgomery*

[Elevation, 240 feet]

Month	Temperature			Precipitation			
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1904)	Total amount for the wettest year (1912)	Snow, average depth
	°F.	°F.	°F.	*Inches*	*Inches*	*Inches*	*Inches*
December	49.3	79	8	4.50	3.04	6.33	0.3
January	48.2	80	5	5.11	4.31	8.71	.2
February	51.6	84	−5	5.52	5.78	5.66	.4
Winter	49.7	84	−5	15.13	13.13	20.70	.9
March	57.8	90	21	6.38	2.30	12.45	Trace.
April	65.3	92	30	4.25	1.82	15.94	Trace.
May	73.4	99	43	3.82	3.47	1.34	.0
Spring	65.5	99	21	14.45	7.59	29.73	Trace.
June	79.6	106	48	4.21	2.19	6.79	.0
July	81.9	107	61	4.68	3.91	5.65	.0
August	80.8	103	58	4.24	6.81	4.58	.0
Summer	80.8	107	48	13.13	12.91	17.02	.0
September	76.3	99	45	2.88	.78	6.31	.0
October	66.6	96	31	2.44	Trace.	1.69	.0
November	55.8	85	18	3.13	2.59	2.44	Trace.
Fall	66.2	99	18	8.45	3.37	10.44	Trace.
Year	65.5	107	−5	51.16	37.00	77.89	.9

AGRICULTURE

From the time of the earliest settlement the interests of Montgomery County have been almost wholly agricultural. The prairie soils and the river terraces and sandy uplands in the northern part of the county were the first lands to be cultivated. Cotton, corn, wheat, oats, hay, and vegetables were grown by the pioneer farmers. The pork, beef, and mutton needed were produced at home, and the farms were practically self-sustaining.

About 1850, cotton production in Alabama centered around Montgomery, and the agricultural wealth of the community reached a high stage. Prosperity was brought to a temporary halt by the Civil War. Although the change in economic conditions following the war hampered all agricultural operations for a while, the recovery in this part of the State was comparatively rapid. Cotton still is an important product of the farm, but considerable revenue is derived from hay in the prairie section. Dairying and the raising of sheep, hogs, and cattle are also important industries.

At the close of the Civil War, which deprived the plantation owners of their organized labor, a large total acreage of farm land was thrown out of cultivation. A tenant system of farming gradually developed. As the negro tenants are best qualified to grow cotton and corn, these staples have increased in importance at the expense of other crops. As a result of growing cotton on the same land year after year or alternating it with corn, another cultivated crop, the productiveness of the upland soils gradually declined. The use of commercial fertilizers was resorted to, and the growing of leguminous crops, such as cowpeas, beans, and peanuts, in conjunction with corn, became more general.

Table 2 gives the acreage of the principal crops as reported by the census.

TABLE 2.—*Acreage of principal crops in Montgomery County, Ala., as reported by the census*

Year	Cotton	Corn	Oats	Hay	Sweet-potatoes	Potatoes	Peanuts
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*
1879	112,125	62,303	4,895	822	1,720	----------	----------
1889	122,432	49,960	5,608	713	1,671	63	----------
1899	133,660	56,696	2,742	5,864	2,577	174	427
1909	157,001	46,769	6,164	10,741	2,234	273	1,012
1919	48,625	62,073	1,098	12,921	7,226	247	5,543
1924	72,108	43,995	768	24,927	1,575	102	11,501

The decline in the acreage of cotton since 1909 is owing to the ravages of the boll weevil. The greatest decrease in acreage was on the heavy soils of the county. The weevil, which made its first appearance in 1914, became very destructive in 1915 and has continued so ever since.

Corn and Johnson grass have very largely displaced cotton on the heavy bottom lands and the prairie soils, and a greater variety of crops is being grown on the sandy uplands than formerly. The adjustment to boll-weevil conditions is not yet complete, but the trend is toward a more diversified form of agriculture in which subsistence

crops will hold a more important place and in which cotton will be largely an added cash crop on many of the farms rather than the only source of revenue. Dairying has become important in the prairie section. Large plantations have been fenced and used for grazing, and a considerable acreage is used for the production of Johnson-grass hay.

At present (1926) agriculture in Montgomery County consists of the production of cotton and Johnson-grass hay as the principal cash crops, and of corn, cowpeas, hay, oats, velvetbeans, soybeans, and a few other forage crops as the principal subsistence crops. Many hogs, sheep, and cattle are raised and sold on local and outside markets. Dairying is on the increase, and on a number of the prairie farms is the principal source of revenue.

Cotton and corn have varied in importance in the last few years, but usually corn has ranked second in acreage. Corn is grown primarily as a subsistence crop. It is used largely for feeding work animals and hogs, and much of it is ground into meal for home use. Part of the crop is made into silage for beef and dairy cattle, and some is used as coarse forage. A few farmers produce a surplus which is sold on the local markets.

Hay is the crop next in importance in the county. The acreage of this crop has increased considerably since 1879. Johnson grass is the principal hay crop. Part of the hay produced is fed on the farm to work animals and cattle, and a large part of it is sold in Montgomery or shipped to outside markets.

Sweetpotatoes and potatoes are grown primarily for home use, but some farmers produce a surplus for market. Peanuts, reported for the first time by the 1900 census, have made a remarkable increase in acreage. Such minor crops as cowpeas, velvetbeans, and peanuts are grown mainly as feed for work animals, cattle, and hogs. These crops are all grown more extensively since the advent of the boll weevil than formerly.

Sugarcane and sorgo (sweet sorghum) are important in furnishing the home with sirup, and on many farms a surplus is sold. The sirup produced on the light sandy soils is of a bright color and has an excellent flavor. If a uniform grade or standard brand of sirup were manufactured and canned, a better price and an easier market could be obtained for this product. A uniform product could easily be produced through community organizations having the latest improved evaporators.

In addition to the crops mentioned, garden vegetables are grown in considerable variety for home use as well as commercially near Montgomery. There are a few peach, apple, and fig trees and grapevines on most of the better farms, but no attempt is made to grow these fruits on a commercial scale. In 1919, 2,343 pecan trees produced 25,206 pounds of nuts. Many large pecan orchards have been set out since that time. The large papershelled varieties, such as the Stuart and Schley, are the most popular. Most of the well-drained sandy upland and terrace soils are suited to the growing of pecans.

The value of animals sold or slaughtered in 1919 was estimated at $204,422. The number of beef cattle raised is increasing steadily, especially on large farms. The quality is being improved by using purebred sires of the standard beef breeds to head the herds. The

long frost-free season allows excellent growth of pasture grasses for livestock grazing. It is generally necessary to feed some hay and cottonseed products or silage during the winter. Silos are in use on practically all the large farms, both corn and sorghum being used for silage.

The annual production of milk, cream, and butter is increasing rapidly. This increase is taking place largely on small farms where from 5 to 10 cows are milked. Most of the milk is sold to the several creameries in Montgomery, but some is shipped to Birmingham and other outside markets. The cows are pastured the year round and are given supplementary feed of either silage, cottonseed meal and hulls, or bran, together with hay or roughage. The pastures supply most of the feed for about 9 or 10 months of the year, and the supplementary feeds are given mainly during December, January, and February. The milk cows are largely Jerseys and Jersey grades.

Hogs are raised on every farm. Most of them are slaughtered for home use, but some are sold at Montgomery. Some of the animals are purebred, the Poland China, Duroc-Jersey, Essex, Berkshire, and Hampshire breeds being represented, but the greater number are common grade stock.

Sheep are raised on many farms in the prairie section of the county. They have increased in number rapidly in recent years, and sheep raising promises to become an important industry.

Poultry and eggs are produced in a small way on most farms. In 1929 they had a value of $267,758, which was practically double the value in 1909.

The farmers of Montgomery County recognize that Houston clay, Catalpa clay, Bell clay, and Congaree silt loam are well suited to corn and Johnson grass, and that Sumter clay, Oktibbeha clay, and Eutaw clay are natural pasture soils. The sandy loam and fine sandy loam members of the Amite, Cahaba, Orangeburg, Ruston, and Greenville series are well suited to cotton, corn, peanuts, velvetbeans, sweetpotatoes, peas, fruits, and garden truck. These soils are considered the best cotton soils in the county. The Susquehanna and Oktibbeha fine sandy loams and Kirvin clay loam are considered best suited to cotton and are less favored for the general farm crops than the members of the five series first mentioned. Susquehanna clay and Eutaw clay are considered best for forestry and pasture. Norfolk fine sand is best suited to peas, peanuts, velvetbeans, and watermelons. The soils best suited to the growing of sugarcane and sorgo are Kalmia fine sandy loam and Leaf fine sandy loam, the land locally called made land, which is mapped as meadow, and the lower slopes of the sandy uplands.

Definite systems of crop rotation are not very generally followed. On many fields cotton and corn have been grown for a number of years in succession or in alternation. The advent of the boll weevil has encouraged the rotation of crops, especially on the upland and well-drained terrace soils. Velvetbeans, cowpeas, and other legumes are now more generally grown than ever before, but they do not occupy a sufficiently large acreage to allow a satisfactory rotation of crops, especially on tenant farms. On farms operated by owners, a greater variety of crops is commonly grown and a rotation is more generally practiced.

Commercial fertilizer is commonly used on all upland soils, except the black prairie soils; none is used on the alluvial lands. Complete fertilizers, consisting of nitrate of soda, phosphoric acid, and potash salts, generally in 3–9–3[1] or 4–8–4 mixtures, are used for cotton. Nitrate of soda is the principal fertilizer for corn. It is applied as a top-dressing when corn is about 2 feet high. The average expenditure for fertilizer in 1919 was about $160 a farm. In 1925 the largest amount of fertilizer in the history of the county was used.

Nearly all farm laborers are negroes. The high wages paid on public works and at sawmills have attracted much labor from the farms, and it is difficult for the farmers to compete with these industries in wages. When employed by the month a laborer's wage is about $20 with board. The day wage ranges from $1 to $3. An average of $308.93 was paid on each farm reporting an expenditure for labor in 1919.

The census of 1920 reports 57.3 per cent of the county in farms. The average size of the farms is 64.6 acres, of which 46.4 acres or 71.8 per cent is improved land. Some land holdings include several thousand acres. The classing of each tenancy as a farm accounts for the small average size of farms reported by the census.

According to the 1920 census, 18.7 per cent of the farms were operated by owners, 80.7 per cent by tenants, and 0.6 per cent by managers. The proportion has varied only slightly since 1880. The tenant system is the best means yet found to keep the farms in operation. Land is rented for cash or on shares. Cash rents vary from $2 to $7 an acre, according to the productiveness of the soil. Share rents are under two plans; where the owner furnishes the land, work animals, and tools he receives half of all crops; where the tenant furnishes work animals and tools the owner receives one-third of the corn and one-fourth of the cotton.

The census of 1920 reports the average assessed value of farm land in the county as $33.61 an acre. Actual sale values range from $5 to $200 an acre. The character of the soil, the surface relief, the location with respect to towns and transportation facilities, and the nature of improvements, including buildings, fences, and other improvements, all are factors which influence the selling price of farm lands. The highest-priced lands are on the Alabama River terraces and on the prairies near Montgomery. The lowest values obtain over the hilly and broken areas in the southern part of the county.

Montgomery County offers excellent opportunities to the home-seeker, as productive soils can be purchased at reasonable prices. The soils are suited to a wide variety of crops, making diversified farming practical.

SOILS

The soils of Montgomery County vary considerably in color, texture, and structure. Perhaps 80 per cent are prevailingly light colored in the surface layers, ranging from light gray or grayish yellow to reddish brown. The Houston, Bell, and Catalpa soils range from dark gray to almost black and contain more organic matter

[1] Percentages, respectively of nitrogen, phosphoric acid, and potash.

than the associated Sumter and Oktibbeha soils. Most of the soils, except the dark-colored soils mentioned above and the Congaree and Ochlockonee soils, are decidedly deficient in organic matter. Except in the prairie region, this county was forested until reclaimed for agricultural purposes, and conditions did not favor an accumulation of vegetable matter in the soil. A slight accumulation of organic matter is present in the first inch or two of the surface soil, but this has not become incorporated in the soil as in the prairie regions of the west where grasses have grown and decayed for centuries.

The prairie section of Montgomery County has supported a grass vegetation for a long time. This accounts for the darker color and larger content of organic matter in the soils except where erosion nas been active, as in the Sumter soils which have only a shallow covering of soil overlying the parent material.

In the prairie section the Houston, Sumter, Bell, and Catalpa soils are either highly calcareous or grade into the soft rotten limestone rock near the surface. Lime carbonate has not formed in any of the soils of the county through the processes of soil development, but it is present in the unweathered part of the limestone or Selma chalk formation which lies near the surface and outcrops in many places. The surface layer of most of the soils is slightly acid in reaction, the small quantity of lime contained in the original material having been lost through leaching. Occurring in close association with the Houston and Sumter soils are the Oktibbeha and Eutaw soils, which are acid but are underlain at a depth varying from 3 to 5 feet by calcareous material.

In this region of heavy rainfall and warm temperature throughout the greater part of the year, leaching and washing out of the soluble plant food in the soils have been active and are still going on. This accounts for the fact that most of the surface soils contain only a comparatively small amount of plant food, in which substance the subsoils, or heavy underlying material, are richer.

Erosion and gullying are particularly noticeable throughout the southern part of the county, especially in areas of Susquehanna, Ruston, Kirvin, and Orangeburg soils. Erosion and translocation of material have not only changed the surface features of these areas but have wrought many changes in the texture, color, and structure of the material. In places, the sandy surface material has been entirely removed, exposing the unweathered formation or the heavier underlying material. In the Sumter soils, the clay surface soil has been removed, exposing the rotten limestone.

Montgomery County is in the coastal plain region of Alabama. According to E. A. Smith, State geologist, two distinct formations underlie and give rise to the upland soils of the county. The Selma chalk, or white limestone formation, extends in a belt from 5 to 10 or more miles wide in an east-west direction across the county, passing just south of Montgomery. Isolated areas of this same formation are present in the southwestern part. The Ripley formation extends across the southern part of the county and where exposed through erosion gives rise to extensive areas of heavy soils. Overlying the Ripley formation, especially on what is known as the Chunnenuggee or strata ridge, is a deposit of unconsolidated sands

and clays which through weathering have produced the light-textured sandy soils of the county.

Soils of Montgomery County fall into two main groups, those having normally well-developed profiles and those not having a normal profile. The first group includes all the soils of the Norfolk, Orangeburg, Ruston, Greenville, Kalmia, Cahaba, Amite, Wickham, Susquehanna, and Kirvin series.

The most striking feature of the texture profile of the well-developed soils in the county is the presence of a comparatively light-textured surface layer overlying a deeper heavier-textured horizon, in many places much heavier, and a third still deeper horizon which may vary considerably in texture but which is prevailingly lighter textured than the second horizon and in most places heavier textured than the first or second layers, which constitute the surface soil. The actual texture of these layers varies greatly in the soils of the region, the surface and subsurface layers ranging from sand to clay loam, and the second horizon, or subsoil, from clay to very light sandy loam or sand. The third horizon, or substratum, consists of unconsolidated geologic material lying beneath the subsoil. It may be composed of material extremely variable in texture, structure, and color. The thickness of the layers also varies widely, that of the surface layer ranging from a very few inches in the clay loams and clays to a maximum of 2 or more feet in the more sandy soils.

The soils of the first group may be subdivided into two subgroups on the basis of the general features of the color profile or the successive color layers or horizons. The virgin soil of the first subgroup, including soils of the Norfolk, Orangeburg, Ruston, Kalmia, Cahaba, Wickham, and Susquehanna series, is marked by the following color profile: (1) A gray or brown layer, from 1 to 3 inches thick, mixed with a small amount of organic matter or leaf mold; (2) a pale-yellow, brown, or red layer showing very little evidence of the presence of organic matter, and in the sandy soils ranging to 2 or more feet in thickness; (3) a yellow, brown, yellowish-red, or red layer, in the Norfolk and Kalmia soils yellow, in the Ruston, Cahaba, and Wickham soils brown or yellowish red, and in the Orangeburg and Susquehanna soils almost blood red or mottled red and yellow; and (4) the upper part of the parent material, varying greatly in color but commonly being mottled reddish brown, yellow, and gray under the Norfolk, Orangeburg, Ruston, and Kalmia soils and bluish gray under the Susquehanna soils.

In the second subgroup of soils, which includes members of the Greenville, Amite, and Kirvin series, the two upper layers range from brown to red. The third layer is deep red in the Greenville and Amite soils and lighter red in the Kirvin.

In most soils of the normally developed group, such as the Norfolk, Orangeburg, Ruston, Greenville, Kalmia, Cahaba, Amite, and Wickham soils, the intermediate or comparatively heavy layer is friable, crumbly sandy clay. The surface soils, except in Susquehanna clay, are light textured, being sand or sandy loam. Susquehanna clay has a decidedly heavy plastic third layer, and there is usually a marked difference in the texture of the first inch or two of the surface soil. The heavy layer of the Kirvin soils differs from that of the Susquehanna soils in that it is tough, stiff, and brittle.

The second group includes soils in which the threefold arrangement or horizon development is not present. The Houston, Sumter, Bell, Catalpa, Oktibbeha, Eutaw, Augusta, Leaf, Myatt, Ochlockonee, and Congaree soils belong to this group, which may also be divided into two subgroups.

The first subgroup includes the prairie or limestone soils and semiprairie soils, members of the Houston, Sumter, Bell, Catalpa, Oktibbeha, and Eutaw series. The surface soils of soils of this group are prevailingly heavy clay, and the subsoils are heavy plastic clay. In the Houston soil, the surface soil is dark colored in contrast with the light color of the Sumter soil and the subsoil is also darker in color and much deeper than in the Sumter. Both of these soils are derived from the Selma chalk, and the subsoils grade into the calcareous material a short distance below the surface. The Bell and Catalpa soils, developed on the second bottoms and first bottoms, respectively, are materials that have been washed largely from the Sumter and Houston soils. They vary in color from almost black to dark gray and in most places are calcareous in the surface layer. The Oktibbeha soils are brown or reddish brown in the surface layer, are well drained, and are underlain at a depth ranging from 3 to 5 feet by calcareous material. The Eutaw soils are poorly drained. The surface layer is gray and is commonly underlain at a depth ranging from 3 to 10 or more feet by calcareous material.

The second subgroup includes soils of the Augusta, Leaf, Myatt, Ochlockonee, and Congaree series. These soils have developed on the terraces and first bottoms from material deposited by the streams. They are poorly drained and have not developed a normal soil profile. In soils of the Leaf series, the surface layers range from silty clay loam to fine sandy loam and the subsoils are heavy, tough clays. The Augusta and Myatt soils differ from the Leaf in that the surface soils are lighter textured and the subsoils are friable. In the Ochlockonee and Congaree soils the relationship of heavy to light-textured layers is unsystematic, that is, the surface soil may be light or heavy, as may also the other layers.

The Guin soils (undifferentiated) consist mainly of disintegrated geologic material rather than a weathered soil. The material mapped as meadow is also too variable in structure and texture to classify as a soil type.

The soils of Montgomery County have been grouped in series on the basis of similarity in color, structure, origin, drainage conditions, and lime content. The soil series are divided into soil types, on the basis of texture, that is, the proportion of clay, silt, and sand entering into their composition.

The upland soils have been grouped in the Norfolk, Orangeburg, Ruston, Greenville, Susquehanna, Kirvin, Houston, Sumter, Oktibbeha, and Eutaw series.

Soils of the Norfolk series are characterized by gray surface layers grading into pale-yellow or grayish-yellow friable single-grained light-textured sandy material. The subsoils are yellow friable, crumbly sandy clay or sand and are underlain by yellow, light-gray, or whitish brittle sandy material mottled with brownish or light red. Two members of the Norfolk series, the fine sandy loam and fine sand, are mapped.

Soils of the Orangeburg series have grayish-brown surface layers, and subsurface layers of yellow or brownish-yellow friable mellow single-grained material. The typical subsoils are bright-red friable, crumbly sandy clay or loamy sand. The substratum is mottled or streaked red, yellow, and whitish hard but brittle material. Orangeburg fine sandy loam, with a gravelly phase, occurs in Montgomery County.

Soils of the Ruston series are characterized by gray or grayish-brown surface layers underlain by yellow or brownish-yellow friable, mellow single-grained subsurface layers. The subsoils consist of reddish-yellow, yellowish-red, or yellowish-brown friable, crumbly sandy clay which continues to a depth ranging from 30 to 60 or more inches. They are underlain by mottled yellowish-red, yellow, and light-gray hard but brittle material. Ruston fine sandy loam, together with a hilly phase, is mapped.

The surface soils of members of the Greenville series are brown or reddish brown. The subsoils are red, moderately friable clay, heavy sandy clay, or loamy sand. In most places at a depth between 40 and 180 inches is mottled or blotched purplish-red, gray, yellow, and whitish hard but brittle clay. Greenville fine sandy loam is mapped.

The 2 or 3 inch surface layer of the sandy members of the Susquehanna series consists of gray friable material. This grades into a subsurface layer of pale-yellow or grayish-yellow friable material. The subsoil is mottled light-red and yellow heavy sticky sandy clay or clay which grades abruptly into mottled light-red, gray, and yellow, heavy, plastic, sticky clay. Beneath this is the parent material, which consists of alternating layers of light-gray or bluish-gray clay and brownish-yellow fine sandy material. The surface soil of the clay member of the Susquehanna series is dark-red clay a few inches thick. This rests on the subsoil. Susquehanna fine sandy loam and Susquehanna clay, with a hilly phase, are mapped in Montgomery County.

The surface soils of members of the Kirvin series are brown or reddish brown. The subsoils are red, tough, compact, hard but brittle clay, which at a depth ranging from about 15 to 20 inches grades into light-red compact tough clay mottled with yellow and fairly brittle and crumbly. Scattered over the surface and mixed with the soil in some places is a noticeable amount of small, platy, and angular iron crusts. Kirvin clay loam is mapped.

The surface soils of members of the Houston series range from dark grayish brown to almost black and are heavy and plastic. The subsoils consist of brownish-yellow or greenish-yellow heavy plastic clay, which at a depth varying from about 15 to 24 inches grades into greenish-yellow plastic clay streaked and mottled with whitish very soft lime nodules. This layer grades at varying depths into the white chalky lime material or Selma chalk from which these soils are derived. The surface soils are commonly calcareous and the lime content increases with depth until the highly calcareous material is reached. The clay is the only member of the Houston series mapped in Montgomery County.

Soils of the Sumter series are characterized by yellowish-gray, light-gray, or brownish-gray surface layers underlain by grayish-yellow heavy plastic clay subsurface layers. The subsoils are yellowish or grayish-yellow fairly crumbly and brittle clay mottled

with light gray and creamy white. The substratum is soft almost white rotten limestone or Selma chalk. The surface soil is calcareous and the subsoil highly calcareous. Sumter clay, with a mixed phase, is mapped.

The surface soils of members of the Oktibbeha series are brown or reddish brown. The subsoils are red heavy clay mottled with gray and yellow. These soils, though noncalcareous, are closely associated with the Sumter soils and in places are influenced by the underlying soft limestone which in most places occurs at a depth ranging from 3 to 8 feet below the surface. Here and there the limestone outcrops or lies near the surface. Three members of the Oktibbeha series, the fine sandy loam, silty clay loam, and clay, together with a hilly phase of the clay, are mapped.

The surface layers of soils of the Eutaw series are gray or brownish and range from fine sandy loam to heavy clay. The subsoils of brownish-yellow, heavy, plastic tough clay faintly mottled with red or brown, grade into mottled or streaked brownish-yellow and bluish-gray heavy plastic clay. Usually gray and white calcareous material is reached at a depth ranging from 4 to 6 feet. Eutaw fine sandy loam and Eutaw clay are mapped.

Along Alabama River and the larger creeks are extensive areas of second bottoms or terraces and wide first bottoms. The material giving rise to these soils was brought down and deposited by the rivers and creeks. Since its deposition, the material on the terraces has been subjected to considerable oxidation, aeration, and leaching, but that in the first bottoms has undergone little change and is still modified at each overflow of the stream. The soils developed on the second bottoms and terraces include those of the Cahaba, Kalmia, Amite, Augusta, Leaf, Bell, Wickham, and Myatt series. In the first bottoms, the Catalpa, Ochlockonee, and Congaree soils have developed.

The Cahaba soils have brown surface layers and reddish-yellow or brownish-yellow subsurface layers. The subsoil is reddish-yellow sandy clay or friable crumbly sand. Cahaba fine sandy loam, with a mixed phase, and Cahaba loamy sand are mapped.

The Kalmia soils have grayish-brown surface layers and pale-yellow friable subsurface layers. The subsoils are yellow friable sandy clay or sand. Kalmia fine sandy loam is mapped.

Soils of the Amite series are characterized by reddish-brown or red surface soils and red friable crumbly subsoils which grade between depths of 3 and 10 feet into stratified gravel and sandy material. Amite sandy loam, together with a sink phase, is mapped.

The surface soils of members of the Augusta series are gray. The subsoils are yellow or grayish-yellow clay or sandy clay mottled with rust brown, red, and yellow. Small soft brown or black accretions occur throughout the soil, as do also a noticeable number of small mica scales, especially in the subsoil. Augusta silt loam is mapped.

The surface soils of members of the Leaf series are light gray, yellowish gray, or brownish. The subsoil characteristically consists of gray or mottled gray and yellow compact silty clay which grades downward into mottled gray, yellow, and red heavy sticky plastic and rather impervious clay. Leaf fine sandy loam and Leaf silty clay loam are mapped.

Soils of the Bell series have dark-gray or almost black surface soils and drab or brownish-yellow heavy plastic clay subsoils. These soils occur on second bottoms and represent material washed mainly from areas of Sumter soils in the limestone region. Bell clay is the only member of this series mapped.

The Myatt soils are characterized by gray or dark-gray surface soils mottled with rust brown, underlain by pale yellowish-gray subsoils mottled with brown, gray, and yellow. Myatt silt loam is mapped.

Soils of the Wickham series have dark-brown surface soils. The subsoils are yellowish-red or reddish-brown rather compact but brittle silty clay, which at a depth ranging from about 20 to 30 inches grades into lighter-red or reddish-yellow silty clay faintly mottled with shades of red, gray, and rust brown. Only the fine sandy loam member of the Wickham series is mapped.

Soils of the Catalpa series are characterized by gray, dark-gray, or rust-brown surface soils, underlain by brownish-gray or drab heavy plastic clay subsoils. These soils occupy the first bottoms of creeks and intermittent streams which rise in or flow through the limy soils and are composed mainly of material washed from the Sumter and Oktibbeha soils of the uplands. Catalpa clay is mapped.

The Ochlockonee soils are marked by the brown color of their surface soils and by the light-brown, or mottled brownish, yellowish, and grayish color of their subsoils. Ochlockonee clay loam is mapped.

The surface layers of the Congaree soils are brown, and the subsoils are light brown. This light-brown color may continue to a depth of several feet or may grade into brownish yellow or gray mottled with rust brown. Considerable mica is present throughout the soil. Congaree fine sandy loam and Congaree silt loam are mapped.

Guin soils (undifferentiated) and meadow are classifications of miscellaneous soil materials.

In the following pages of this report the soils of Montgomery County are described in detail and their agricultural importance is discussed; their distribution is shown on the accompanying soil map; and their acreage and proportionate extent are given in Table 3.

TABLE 3.—*Acreage and proportionate extent of the soils mapped in Montgomery County, Ala.*

Type of soil	Acres	Per cent	Type of soil	Acres	Per cent
Houston clay	10,752	2.1	Amite sandy loam	8,640	1.9
Sumter clay	45,504	11.7	Sink phase	832	
Mixed phase	14,976		Cahaba fine sandy loam	15,424	3.6
Oktibbeha clay	37,248	9.4	Mixed phase	3,200	
Hilly phase	11,392		Cahaba loamy sand	5,248	1.0
Oktibbeha silty clay loam	7,424	1.4	Kalmia fine sandy loam	16,256	3.1
Oktibbeha fine sandy loam	9,024	1.7	Leaf silty clay loam	7,168	1.4
Eutaw clay	6,720	1.3	Leaf fine sandy loam	29,504	5.7
Eutaw fine sandy loam	2,880	.6	Augusta silt loam	9,216	1.8
Susquehanna clay	43,840	10.1	Myatt silt loam	8,384	1.6
Hilly phase	8,320		Bell clay	32,704	6.3
Susquehanna fine sandy loam	16,448	3.2	Wickham fine sandy loam	8,768	1.7
Ruston fine sandy loam	15,488	5.9	Congaree silt loam	10,240	2.0
Hilly phase	14,848		Congaree fine sandy loam	2,880	.6
Orangeburg fine sandy loam	3,776	.8	Ochlockonee clay loam	14,400	2.8
Gravelly phase	448		Catalpa clay	33,536	6.5
Greenville fine sandy loam	7,488	1.5	Guin soils (undifferentiated)	8,320	1.6
Kirvin clay loam	3,584	.7	Meadow	25,024	4.8
Norfolk fine sandy loam	13,248	2.6	Gravel pits	192	.1
Norfolk fine sand	2,496	.5	Total	515,840	

HOUSTON CLAY

The surface soil of Houston clay, to a depth ranging from 6 to 8 inches, consists of dark grayish-brown or almost black heavy clay slightly tinged with brown. This is very sticky and plastic when wet and extremely hard and compact when dry. In cultivated fields, it crumbles into moderately fine granular or buckshotlike particles which range in size from very small to an inch or more in diameter. The finer granules predominate. The subsoil begins as brownish-yellow or drab heavy plastic clay. This, within the first few inches, grades into brownish-yellow or greenish-yellow very heavy plastic clay, which continues to a depth ranging from about 15 to 18 inches. This layer is underlain by a yellow plastic clay layer streaked or mottled with whitish very soft lime particles, and this layer, in turn, at a depth ranging from 30 to 40 inches, passes into light yellowish-gray or whitish moderately crumbly and friable chalky clay streaked with yellow and gray. This material is underlain by bluish-gray or white rotten limestone or Selma chalk, which occurs in most places between 40 and 70 inches below the surface. This chalk contains from 60 to 80 per cent of calcium carbonate. The surface soil is commonly slightly calcareous, the upper part of the subsoil is calcareous, and the lower part of the subsoil is decidedly calcareous. During very dry seasons, cracks occur in both the surface soil and subsoil, except in freshly cultivated fields.

In areas bordering the heads of streams and swales and in a few places on the slopes, the surface soil is very dark-gray or black heavy plastic clay from 8 to 18 inches thick. This is underlain by the typical Houston clay subsoil. Such areas are really Houston black clay, but on account of their small extent they were not separated on the soil map. Another variation occurs where the surface soil is shallower, the subsoil layer thinner, and the lime material nearer the surface. Such areas approach Sumter clay in their characteristics.

The surface is sufficiently undulating or rolling to insure good surface drainage, but on account of the heavy subsoil underdrainage is slow.

The largest areas of Houston clay are north, south, and east of Pike Road. Smaller areas occur throughout the prairie section of the county. Although comparatively inextensive, the soil is important agriculturally. It is locally known as "black prairie land." Practically all of it is either under cultivation or is used for mowing and pasture lands. The soil has long been under cultivation without fertilizer application, and the large yields still obtained attest its natural fertility and productiveness.

Hay and corn are the principal crops, but a small acreage is still devoted to cotton. Before the advent of the boll weevil practically all the Houston clay was planted to cotton. Johnson grass and Bermuda grass, the principal hay crops, yield from 1 to 3 tons to the acre. Melilotus and a number of other clovers thrive. Cultivation of hay land is essential every two to three years to produce a good grade of hay. In fields that have not been plowed for several years broom sedge, water grass, and other coarse weeds

spring up and soon choke out the valuable grasses. The value of Houston clay as hay land has resulted in the development of cattle, sheep, and hog raising as the chief industries through this section, and some plantations are devoted almost exclusively to dairying and livestock raising in conjunction with the production of the wild-hay grasses for livestock feed and for market.

Cotton produced from one-half to 1 bale to the acre on this soil before the advent of the boll weevil, but the present average yield is about one-fifth bale. Boll-weevil conditions have been responsible for a diversification in farming, and few farmers now depend entirely on cotton for their cash income. Under favorable moisture conditions corn yields from 20 to 40 bushels to the acre, although higher yields are reported. Oats are used as a winter cover crop by some of the more progressive farmers, who in this way protect their lands from washing and have green pasture for late winter. Forage crops, such as cowpeas, velvetbeans, sorghum, and millet, as well as many kinds of vegetables, do well on this soil, but it is not a good fruit soil.

Houston clay is rather heavy to work, and for this reason plowing has generally been shallow and seed-bed preparation inadequate. The soil is very tenacious when wet and if plowed when in this condition is apt to bake into hard clods on drying. Owing to its calcareousness and large content of organic matter, it assumes a granular structure if plowed and cultivated when the moisture content is right. Fertilizers are seldom used.

Houston clay sells at prices ranging from $30 to $100 an acre, depending on improvements and location with reference to shipping points and markets.

Improved labor-saving machinery can be used on this soil, and heavier implements should be employed in plowing and preparing the seed bed. To insure good tilth the field should be thoroughly harrowed soon after being plowed. Deep fall plowing is advisable. Areas which show a tendency to wash should be used as pasture or hay land, or if cultivated should be seeded to a winter cover crop. The crops grown should be arranged in a systematic rotation including leguminous crops for forage and green manure. In general Houston clay has a good supply of organic matter, but the incorporation of fresh vegetable matter will greatly increase the productiveness of areas which have been under constant cultivation for a long time.

This soil offers excellent opportunities for livestock raising and dairying. It is the best upland corn and grass soil and where well drained is especially well suited to alfalfa.

SUMTER CLAY

In virgin areas of Sumter clay, the material to a depth ranging from 2 to 4 inches is yellowish-brown or grayish-brown clay. This layer is underlain by light-gray or greenish-gray clay which continues to a depth of 6 or 8 inches. The surface soil is sticky and plastic when wet but assumes a crumbly structure on drying. The subsoil of yellowish clay mottled with light gray and creamy white is plastic when wet but brittle and crumbly when dry. In most places, at a depth varying from 18 to 24 inches, it grades into soft

almost white rotten limestone or Selma chalk which at varying depths is underlain by bluish-gray rotten limestone. In places the soft white limestone material comes near the surface, and outcrops are common. The surface soil is calcareous and the subsoil highly calcareous. The white mottles seen in the subsoil are soft calcareous nodules. In many locations shells and shell fragments are common on the surface and throughout the subsoil. In cultivated fields the soil is light-gray or grayish-yellow clay.

Several variations from the typical soil are included with Sumter clay in mapping. In some areas the surface soil is dark gray or rust brown. On most slopes and knolls the surface soil is shallower than typical, and on many of the more pronounced slopes it has been entirely removed by erosion, the mottled yellowish subsoil being exposed. Many small areas of Oktibbeha clay or a shallow phase of that soil, which have no apparent relation to the relief, are also included with Sumter clay in mapping. The surface soil in these patches is yellowish-red or brownish-red clay. Where such spots are so numerous as to occupy from 20 to 40 per cent or more of an area they are shown on the soil map as Sumter clay, mixed phase. In many slightly depressed or rather flat areas the surface soil of Sumter clay is darker and deeper than typical, resembling Houston clay.

Sumter clay occurs extensively in the north-central or "black belt" part of the county. The valleys are generally shallow and open, and the stream courses are bordered by comparatively long, gentle slopes. Abrupt slopes occur in only a few places. The surface is sufficiently sloping to induce good surface drainage, but, owing to the imperviousness of the subsoil, internal drainage is slow. This causes a comparatively heavy run-off, and unless protective measures are employed injurious erosion takes place on the more pronounced slopes.

Sumter clay is one of the most important soils in the county. Only about 15 per cent of it is used for cultivated crops at present (1926). Some abandoned fields have grown up in broom sedge, but most of the land is used as pasture or hay land. This soil is locally known as "gray prairie." It is naturally a grass soil. Wild prairie grasses are native to it, and parts of the land are well sodded with Bermuda grass, Johnson grass, crabgrass, Dallis grass, and Melilotus (sweetclover) and several wild clovers.

The principal crops grown on Sumter clay are corn, hay and pasture grasses, oats, cowpeas, velvetbeans, millet, and sorgo. Prior to the advent of the boll weevil cotton was extensively grown. It is still grown to some extent, principally by negro tenant farmers.

Hay is the principal cash crop. Corn and other crops are grown largely to feed the work animals on the farm. On some of the larger farms, which are operated principally by owners, sorgo, millet, and a part of the corn crop are made into silage for feeding beef and dairy cattle. Increased attention is being given to livestock farming on this soil.

Corn yields range from 10 to 30 bushels to the acre, depending on seasonal variations and cultural methods. Before the advent of the boll weevil cotton yielded from one-fourth to three-fourths bale to the

acre, but under present conditions the yield is considerably lower and is very uncertain. Johnson grass yields from 1 to 2 tons of hay; alfalfa, which is grown in a small way on a few farms, yields from one-half to 3 tons; and oats yield from 20 to 40 bushels to the acre.

The farming methods used on Sumter clay are the same as on all upland soils in Montgomery County. The equipment on the average tenant farm is too light for deep plowing and efficient preparation of the seed bed. Most of the plowing is done in February and March. Owing to the heavy texture of the soil, the depth of plowing is seldom more than 3 or 4 inches. Corn, cotton, sorghum, millet, cowpeas, and velvetbeans are grown on ridges and are intertilled. The cultivation given these crops is done with light turning plows, sweeps, and shovels, and although this practice does not conserve moisture it is remarkably thorough. On many of the owner-operated farms heavier equipment, such as walking and riding plows turning a 10 or 12 inch furrow, disk and section harrows, seeders, grain binders, and cultivators, is used.

Systematic crop rotations are not generally practiced. The small range of the crops grown on the average tenant farm precludes the practice of any rotation beyond the growing of cowpeas and velvetbeans in conjunction with part of the corn. On these farms the fields are usually left bare throughout the winter. On farms operated by owners a greater variety of crops is grown. These do not generally follow a systematic rotation, but they are alternated more frequently and cowpeas and velvetbeans are grown more extensively with the corn.

Oats are sown in the fall, and after serving as a winter cover crop and affording some grazing in early spring they are cut for hay or harvested for grain in May or the early part of June. Where fields are seeded to Johnson grass a good yield of hay is obtained after the oats are harvested, or oats may be followed by late corn, by cowpeas and corn, or by cowpeas sown broadcast alone. On some farms where cowpeas are grown alone after oats, they are grazed to some extent, then mowed, after which the land is disked thoroughly and the residue turned under in late fall. The succeeding crops are said to be markedly benefited by this incorporation of vegetable matter.

At the present time fertilizers are not used to any appreciable extent for cotton, because of the uncertain yield under boll-weevil conditions. Superphosphate (acid phosphate) and nitrate of soda are used to some extent on oats. The phosphate is applied at planting time and the nitrate of soda in the spring as a top-dressing.

The current selling price of Sumter clay ranges from $10 to $40 an acre, depending on improvements and location.

Crop yields on Sumter clay vary widely in different places, but this soil can be built up to a uniformly high state of productiveness. The foremost need is an increase in the organic-matter content. Steps should be taken to prevent the soil wastage caused by washing and erosion, and the land should be plowed deeper and more thoroughly prepared before planting. A systematic rotation should be adopted to include summer legumes for green manure and cover crops to occupy the fields during the winter. Cowpeas, velvetbeans, soy-

beans and sweetclover are well suited for use as green manure. Oats, rye, crimson clover, bur clover, and hairy vetch are good winter cover crops which incidentally furnish green manure. Leguminous crops are preferable to grains because of their action in storing nitrogen in the soil. The liberal incorporation of vegetable matter and deeper plowing will greatly increase the ability of the soil to absorb and retain moisture.

In order to plow Sumter clay deeply and prepare a good seed bed, the light equipment commonly used should be replaced by larger plows, disk and section harrows, and other heavier implements, requiring a 3 or 4 mule team. The soil is well suited to the use of labor-saving machinery, and such implements as weeders and cultivators can probably be used to advantage.

Sumter clay is primarily suited to general farming. It is adapted to the crops commonly grown, such as corn, Johnson grass, millet, sorghum, oats, cowpeas, soybeans, and velvetbeans. Vetch, bur clover, sweetclover, and crimson clover also thrive. Sumter clay, because of its suitability for pasture, hay, and forage crops, offers excellent opportunities for dairying and the raising of cattle, hogs, horses, and mules.

Sumter clay, mixed phase.—Sumter clay, mixed phase, is locally known as "mixed prairie." It includes areas of Sumter clay and Oktibbeha clay, together with small areas of Houston clay, so intricately associated and so inextensive that their separation on the soil map is impossible. The included areas of Sumter clay are typical, but those of Oktibbeha clay are in some places underlain by calcareous material at a depth between 2 and 5 feet.

Sumter clay, mixed phase, occurs in the prairie section of the county in close association with the Oktibbeha and Sumter soils. The largest areas are north of Barachias, south of Waugh, and southeast of Pike Road.

Soil of this phase is comparatively inextensive. The relief and drainage are practically the same as on Sumter clay and Oktibbeha clay. Probably 35 or 40 per cent of the soil is devoted to cultivated crops and hay. Most of the remainder is utilized for pasture. The spots of Sumter clay support a natural growth of Johnson grass, Melilotus, and clovers. Johnson grass, crabgrass, broom sedge, and other native grasses and legumes are common on the included Oktibbeha clay. The uncleared spots of Oktibbeha clay support a growth of shortleaf pine, mixed with oaks and sweetgum, whereas included areas of Sumter clay are prairie land.

In general the crops grown, the yields obtained, and the methods of farming and fertilization are similar to those prevailing over typical Sumter clay and Oktibbeha clay areas.

This land is sold in conjunction with the adjoining soils.

OKTIBBEHA CLAY

The surface layer of Oktibbeha clay in virgin or wooded areas consists of dark-brown clay loam from 1 to 2 inches thick. This is underlain, to a depth ranging from 6 to 10 inches, by dull-red or yellowish-red clay, plastic and sticky when wet and hard, compact, and brittle when dry, which breaks down to a coarse or cloddy structure. The subsoil is mottled dull-red, yellow, and gray plastic im-

pervious heavy clay. The red mottles decrease with depth and the yellow coloring increases. This layer continues to the underlying stratum of soft grayish or whitish limestone (Selma chalk), reached at a depth between about 30 and 50 inches. In many places the limestone comes much nearer the surface, and here and there, where erosion has been active, it outcrops. In cultivated fields the organic matter in the first inch or two of the topsoil soon disappears, and the soil is dull red or brownish red in color.

Areas of Oktibbeha clay are fairly uniform in texture and color, but some small areas of Sumter clay, Oktibbeha silty clay loam, and Oktibbeha fine sandy loam have been included in mapping.

Oktibbeha clay is rather widely distributed throughout the prairie section of the county. The largest areas occur in T. 14 N., Rs. 19 and 20 W. Areas range from gently rolling to rolling, and most of the slopes are long and gentle. The streams flow in rather shallow, open valleys. Internal drainage is very slow, owing to the imperviousness of both surface soil and subsoil. This imperviousness prevents the ready absorption of rain water and causes a heavy run-off, so that fields are frequently badly washed and gullied even on rather moderate slopes.

Oktibbeha clay is locally known as "red prairie." It is of considerable importance on account of its extent. Practically all this soil has been cultivated at one time or another, but at present much of it supports a second growth of shortleaf pine, mixed with oak, hickory, sweetgum, black gum, haw, and locust. Johnson grass, Lespedeza, Dallis grass, Bermuda grass, and white clover constitute the principal hay and pasture grasses. Broom sedge, bitterweed, and many other coarse weeds and grasses tend to crowd out the good pasture grasses where the land is not mowed every year. Probably 20 per cent of the land is now cultivated, and about one-half of the remainder is in hay or permanent pasture. Good grazing is afforded for about 9 or 10 months in the year.

Corn, cotton, and hay are the chief crops. Cotton and hay are the money crops. Practically all the corn produced is used to feed the work animals. Oats are grown to some extent and are fed largely in the sheaf to work animals. Peanuts, cowpeas, soybeans, and velvetbeans do well on this soil but are grown only for home consumption. Tomatoes have been grown commercially on this soil in other sections of the country. Dairying, combined with the raising of cattle, sheep, and hogs, is rapidly becoming an important industry, and many plantations which were formerly farmed have been fenced and are now used almost exclusively for livestock industries.

Before the advent of the boll weevil cotton yields averaged about one-third bale to the acre without fertilization, and ranged from one-half to three-fourths bale where fertilizer was used. At present the yield is low and very uncertain. Corn yields range from 10 to 20 bushels to the acre. Where given an application of about 100 pounds of nitrate of soda as a top-dressing when the corn is about 2 feet high or where barnyard manure is used at planting time the yields are higher. Johnson grass produces from 1 to 2 tons of hay to the acre. The hay is generally mixed with coarse weeds and grasses, but where the crop is grown in rotation with oats or the land is plowed every two or three years a better quality of hay is

produced. Two or three acres of this land is considered ample to provide grazing for 1 head of livestock. From 3 to 5 acres are required on timbered areas.

Owing to the heaviness and tenacity of this soil, it is seldom plowed to a depth of more than 4 inches. It can be plowed and cultivated within only a narrow range of moisture conditions. Plowing is often delayed in the spring because of the tendency of the soil to bake into clods if plowed when wet. Few farmers have given much attention to the problem of maintenance of fertility and permanent improvement. Very little fertilizer is used, and only rarely are green cover crops plowed under. All available barnyard manure is scattered over the cotton and corn lands.

The current selling price of Oktibbeha clay ranges from about $10 to $40 an acre, depending on location and improvements. The average selling price is about $20.

The methods of improvement suggested for Sumter clay can be followed with equally good results on Oktibbeha clay. Unlike Sumter clay, however, this soil is decidedly acid above the limestone substratum, and applications of air-slaked lime or ground limestone are necessary for best results for most leguminous crops. The underlying limestone could be pulverized and spread over the soil with equally good results.

Lack of an adequate water supply has always been a drawback to settlement on this soil. Water for cattle must be collected in pools or basins during the winter or spring because the creeks dry up during the summer. Rain water caught in cisterns or water from deep drilled wells is used for drinking water.

Oktibbeha clay, hilly phase.—In virgin areas Oktibbeha clay, hilly phase, commonly has a surface covering of very fine sandy loam from 4 to 6 inches thick, consisting of an inch or two of very dark-colored or humus-filled fine sandy loam underlain by gray fine sandy loam containing very little organic matter. The subsoil of yellowish-red or yellowish-brown heavy plastic clay continues to a depth ranging from 10 to 15 inches, where it grades into bright-yellow or yellowish-brown plastic clay. The lower part of the subsoil is somewhat more friable than the upper part, especially where mica scales are present. This clay is abruptly underlain by light-colored highly calcareous material, the partly weathered upper part of the parent material of Ripley marl. This marl contains a large quantity of finely divided mica flakes. Where the total depth to the marly material exceeds 40 inches the layer overlying the marl is generally mottled and the material is really Susquehanna clay. The hilly phase of Oktibbeha clay is closely associated with Susquehanna clay, and sharp lines of separation were not possible.

More than 90 per cent of this soil has lost the original thin covering of humus-filled sand and silt, and the surface soil is reddish-yellow or light-yellow clay of extremely variable thickness. The underlying calcareous material is exposed in gullies and appears as bare whitish patches in almost every old field and pasture.

Oktibbeha clay, hilly phase, occurs in the southern part of the county, mainly east and west of Fleta, which town is located on the largest single area of this soil. Areas consist of a succession of comparatively low hills and ridges, dissected by numerous inter-

mittent stream heads and gullies. Drainage is excessive, and erosion is active over most of the land.

The greater part of the Oktibbeha clay, hilly phase, is in forest, consisting of a mixed stand of pine, oak, hickory, and other hardwoods. The cleared land includes abandoned fields, pastures, and here and there small cultivated patches. The same crops are grown and practically the same yields are obtained as on typical Oktibbeha clay. The pasture lands support a mixed growth of Lespedeza, Melilotus, and other clovers, carpet grass, Dallis grass, Johnson grass, broom sedge, and coarse weeds. These grasses furnish good grazing for about 10 months of the year. On account of its hilly relief and the resultant erosion, the greater part of the land is economically better suited to grass and timber than to cultivated crops.

In Table 4 are shown the results of mechanical analyses of samples of the surface soil, subsurface soil, and subsoil of typical Oktibbeha clay.

TABLE 4.—*Mechanical analyses of Oktibbeha clay*

No.	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
416908	Surface soil, 0 to 8 inches	1.0	1.5	2.2	23.7	26.5	16.0	29.1
416909	Subsurface soil, 8 to 38 inches	.2	1.0	1.4	17.0	16.7	16.4	47.2
416910	Subsoil, 38 to 60 inches	.0	.3	.5	6.7	16.8	32.8	43.0

OKTIBBEHA SILTY CLAY LOAM

The surface layer of Oktibbeha silty clay loam in virgin areas is dark grayish-brown loam or silt loam from 2 to 3 inches thick. This is underlain by grayish-yellow or yellow heavy loam or silty clay loam which continues to a depth ranging from 3 to 5 inches. The surface soil is slightly sticky when wet but is friable when dry. The subsoil to a depth varying from 12 to 15 inches is reddish-yellow or yellowish-red sticky heavy silty clay mottled with yellow. Below this layer the material is mottled yellow, red, and gray heavy sticky plastic clay in which the yellow mottles increase with depth. This material grades at a depth varying from about 24 to 40 inches into yellow more friable silty clay containing numerous whitish lime nodules and underlain by grayish-yellow partly decomposed limestone or Selma chalk. In cultivated fields the soil is grayish yellow.

Oktibbeha silty clay loam occurs in close association with other members of the Oktibbeha series and with Sumter clay. The largest areas are north of Cecil, southwest of Montgomery, and west of Faulkners. Smaller areas are scattered throughout the prairie section of the county.

Areas of this soil range from nearly level to gently rolling and generally lie slightly lower than the adjoining soils. Surface drainage is fairly well established, but the heavy texture of the subsoil retards the downward movement of water.

Oktibbeha silty clay loam, although inextensive, is a good agricultural soil. Probably 70 per cent of the land is under cultivation, and the remainder is in pasture and forest. The principal crops are

corn, hay, and oats. Yields average higher than on Oktibbeha clay. Corn produces from 20 to 40 bushels to the acre, Johnson grass hay from 1 to 2 tons in three or four cuttings, and oats from 30 to 50 bushels. Oats are generally sown in the fall and are either cut for hay or harvested for grain. Before the advent of the boll weevil, cotton was the principal crop on this soil and produced from one-half to three-fourths bale to the acre. At the present time the yields are much lower and are very uncertain.

Land of this kind commands from $20 to $50 an acre, depending on location and improvements.

The methods of improvement suggested for Oktibbeha clay apply equally to this soil.

OKTIBBEHA FINE SANDY LOAM

The surface layer of Oktibbeha fine sandy loam in wooded areas is dark grayish-brown fine sandy loam 2 or 3 inches thick. It is underlain by a grayish-brown or yellowish fine sandy loam subsurface layer continuing to a depth of 6 or 8 inches. The surface soil is mellow and has a single-grained structure. The subsoil is dull-red or yellowish-red heavy moderately compact sticky plastic clay, slightly mottled with red and yellow. This grades at a depth ranging from 12 to 20 inches into purplish-red or yellowish-red heavy plastic clay mottled with red, gray, and yellow, which continues to a depth ranging from about 30 to 60 inches. This layer is underlain, in turn, by a mottled brownish-yellow and light-gray friable layer containing much soft and hard limy material. In cultivated fields the soil is grayish brown.

Where the surface soil is deep, the surface layer is gray or yellowish gray. In spots, where the surface soil is shallow and approaches loam or clay loam, the surface layer is reddish brown. Small patches of Oktibbeha clay and Ruston fine sandy loam have been included with Oktibbeha fine sandy loam in mapping. Limestone outcrops occur in a few places.

Oktibbeha fine sandy loam occupies 14.1 square miles in Montgomery County. The largest areas are south of Montgomery, south of Mitylene, and at Perrys Mill. The relief is featured by low, smoothly rounded hills and gentle slopes. Surface drainage is well established, but the heavy compact subsoil interferes with internal drainage.

Probably from 70 to 80 per cent of the land is cleared and under cultivation. The remainder supports a growth of shortleaf pine mixed with oaks, hickory, gums, crab apple, locust, and plum.

Cotton and corn are the principal crops. Cotton produces from one-sixth to one-half bale to the acre, averaging about one-fourth bale in good seasons where fertilized with from 200 to 400 pounds of high-grade commercial fertilizer; and corn produces from 10 to 30 bushels, the higher yields obtaining where stable manure is used or where an application of about 100 pounds of nitrate of soda is applied when the corn is about 2 feet high. Cowpeas, velvetbeans, and peanuts yield well and are often seeded in corn and hogged off by cattle and hogs. Sweetpotatoes and garden vegetables do well but are grown only for home use. Bermuda grass and Johnson grass furnish excellent pasturage and when cut for hay yield from 1 to 2 tons to the acre.

This soil can be handled early in the spring with light farm equipment, and it responds readily to fertilization and careful preparation. However, no rotation is practiced and little fertilizer is used.

Farm land of this kind commands from $20 to $30 an acre, depending on location and improvements.

EUTAW CLAY

The surface soil of Eutaw clay in wooded or old-field areas to a depth of 6 or 8 inches consists of brownish-gray or gray heavy tough clay which is adhesive when wet and hard when dry. The subsoil is brownish-yellow or yellow, faintly mottled with red or brown, heavy plastic tough clay. At a depth ranging from 18 to 24 inches this layer grades into grayish-yellow heavy plastic clay mottled with shades of gray and brown, the gray color increasing with depth. This layer, in turn, grades at a depth varying from 4 to 8 feet into gray and white calcareous material.

Eutaw clay is inextensive and agriculturally unimportant. The largest areas are between Mathews and Cecil, about 2 miles north of Pike Road, and southeast of Antioch. Smaller areas are scattered throughout the prairie section of the county. This soil occurs as a prairie border, lying between the prairie uplands and the stream terraces below. In some locations it is possibly old alluvium. The surface varies from flat to slightly undulating in some places. The surface run-off of rain water is slow, and the dense structure of the subsoil retards internal drainage.

The greater part of this land has been cleared of its timber growth and is now mainly in pasture and abandoned fields. Small areas are used as hay land. The wooded areas support a growth of hardwoods, together with scattered shortleaf pine. Johnson grass produces from one-half to three-fourths ton of hay to the acre in good seasons. Dallis grass, Lespedeza, and broom sedge are the principal pasture grasses. Ragweed, bitterweed, and many other coarse weeds and grasses tend to crowd out the better pasture grasses. Grasses and other vegetation suffer from lack of moisture during prolonged droughts. This soil is hard to handle and is better suited to pasture and forestry than to cultivated crops.

The selling price of Eutaw clay is from $10 to $20 an acre.

EUTAW FINE SANDY LOAM

The surface soil of Eutaw fine sandy loam consists of grayish-brown fine sandy loam or very fine sandy loam from 4 to 8 inches thick. It is underlain by material similar to that under Eutaw clay.

Like Eutaw clay, this soil is inextensive and of low agricultural value. The largest areas are south and southeast of Merry and near Cecil. The surface varies from nearly level to undulating. Surface drainage is fairly good, but internal drainage is poor, owing to the density of the subsoil.

About 50 per cent of the land is cleared, but a very small part of it is now farmed and that only in patches. Crop yields are low. Much of the cleared land is in pasture and the native grasses, among which are Lespedeza and carpet grass, furnish fair grazing during the spring and summer. The wooded areas support a mixed growth of oak, gum, and pines. The soil is valued chiefly for forestry and pasture. Its selling price is about the same as that of Eutaw clay.

SUSQUEHANNA CLAY

The surface soil of Susquehanna clay in wooded areas is reddish-brown loam or clay loam, underlain at a depth of 2 or 3 inches by dull-red heavy plastic clay which continues to a depth ranging from 10 to 15 inches. Below this is the intensely mottled light-gray, red, and yellow plastic cohesive clay subsoil in which a small amount of finely divided mica scales occurs and which extends to a depth varying from 60 to 72 inches. The upper part of this layer shows more red, whereas light gray predominates in the lower part. On drying the material breaks into irregular-shaped lumps of various sizes. This layer, in turn, is underlain by the parent material which consists either of alternating layers of light-gray or bluish-gray clay and brownish-yellow fine sandy material or of yellowish partly weathered calcareous marl.

No important change in texture and structure occurs in typical areas of this soil from the surface downward, but in areas underlain by marl the mica content is higher in many places, giving to the lower part of the subsoil a greasy feel and very noticeable friability. Exposures of marl are common over much of the soil in the southern part of the county, and in places fossil shells and lime nodules are found on the surface. However, the marl generally lies from 8 to 15 feet below the surface.

A covering of fine sandy loam ranging from 1 to 5 inches in thickness occurs over some areas of Susquehanna clay. The sandy covering, however, is prevailingly very shallow, and only in spots too small to map is it deep enough to prevent plows from reaching the tough clay. A few small areas of Ruston fine sandy loam are also included in mapping. Such patches occupy the crests of hills or knolls.

Susquehanna clay occurs only in the southern half of the county. The largest areas are south of Macedonia, southwest and west of Downing, east and west of Sprague, and west of Ramer.

Susquehanna clay occupies rolling, gently rolling, undulating, and gently sloping areas. Surface drainage is good or excessive over most of the soil. On account of the close, impervious consistence of the subsoil, water moves through it very slowly. The soil is droughty, and the small streams invariably go dry during the dry season.

Most of this land is in forest. The tree growth consists of old-field, longleaf, and shortleaf pines, post oak, blackjack oak, sweetgum, black gum, and some other hardwoods. The natural grasses are principally broom sedge and other coarse grasses. Lespedeza, Johnson grass, Bermuda grass, and carpet grass spring up in cleared fields and furnish fairly good grazing.

This soil is farmed in small patches, principally by tenants. Cotton and corn are the chief crops, and yields of these and of minor crops are low.

Land of this kind sells at prices ranging from $5 to $15 an acre, depending on location, improvements, or character of the standing timber.

Susquehanna clay is best suited to use as timber and pasture land. Its potential fertility is probably high, but its physical structure renders it difficult to manage and consequently unfavorable condi-

tions often prevail during the growing season. It could be greatly benefited by plowing under green-manure crops. This would improve the physical condition of the soil, increase the supply of nitrates, and render more soluble the mineral elements that in its present condition are largely unavailable. Applications of lime would improve the physical condition and correct the acidity.

Susquehanna clay, hilly phase.—The hilly phase of Susquehanna clay is similar to the typical soil, but it has been separated because of its hilly, rough, and eroded condition which renders it unsuitable for general farming. Its agricultural value is lower, and it is much more difficult to handle than the typical soil. Erosion is severe unless the soil is protected by vegetation. Some patches can be cultivated, but the greater part should remain forested or be allowed to reforest itself. It has some slight value for pasture, but it is valued mainly for its timber growth.

In Table 5 are shown the results of mechanical analyses of samples of the surface soil, subsurface soil, and two layers of the subsoil of typical Susquehanna clay.

TABLE 5.—*Mechanical analyses of Susquehanna clay*

No.	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		Per cent	*Per cent*	*Per cent*	*Per cent*	Per cent	*Per cent*	*Per cent*
416914	Surface soil, 0 to 3 inches	0.2	3.2	5.0	40.0	15.6	21.5	14.7
416915	Subsurface soil, 3 to 15 inches	.3	3.6	3.4	19.6	3.8	20.5	48.8
416916	Subsoil, 15 to 48 inches	.4	3.9	4.6	26.8	5.4	17.4	41.8
416917	Subsoil, 48 to 72 inches	.2	2.4	2.0	31.4	11.6	14.3	37.8

SUSQUEHANNA FINE SANDY LOAM

The surface layer of Susquehanna fine sandy loam in wooded areas is gray fine sandy loam from 3 to 6 inches thick. This grades into pale-yellow or grayish-yellow fine sandy loam which continues to an average depth of about 10 inches. The subsoil is identical with that of Susquehanna clay.

There is considerable variation in the depth of the sandy surface layer. On steep slopes it is rarely more than 6 or 8 inches thick, but on gentle slopes and nearly level areas it may continue to a depth ranging from 16 to 20 inches. On some of the steep slopes that have been in cultivation for a number of years the surface covering of fine sandy loam has been entirely removed by erosion in places, and the dull-red clay is exposed.

Susquehanna fine sandy loam is fairly extensive. It occurs in comparatively small widely separated areas in the south-central and southern parts of the county, where it occupies valley slopes and, to a less extent, ridges and divides. The surface varies from gently sloping to rolling. Natural surface drainage is good, but the movement of soil water through the subsoil and the underlying formation is slow. Consequently the soil is inclined to be droughty.

Only about 30 per cent of the Susquehanna fine sandy loam is cultivated. The remainder is in woods, idle fields, and pastures. The tree growth is similar to that on Susquehanna clay. The land is used for general farming, principally to cotton and corn. Cotton

produces from one-eighth to one fourth bale to the acre. Where high-grade commercial fertilizers are applied at the rate of 400 to 600 pounds to the acre much higher yields are obtained. The acre yield of corn ranges from 8 to 15 bushels. Cowpeas, velvetbeans, and peanuts give fairly good returns.

Land of this kind sells at prices ranging from $10 to $20 an acre.

RUSTON FINE SANDY LOAM

In wooded areas the surface soil of Ruston fine sandy loam to a depth of 2 or 3 inches is brownish-gray loamy fine sand containing a small amount of organic matter. This grades into pale-yellow, grayish-yellow, or brownish-yellow loamy fine sand which continues to a depth varying from 12 to 15 inches. The subsoil is yellowish-red or yellowish-brown fine sandy clay, fairly heavy but friable and crumbly. The material crumbles into irregular-sized lumps and shows slight reddish-brown coloration along fracture planes. Below a depth ranging from 30 to 40 inches this layer grades into brownish-yellow or reddish-brown, with streaks of yellow and gray, hard but brittle fine sandy material which contains small scales of mica. In places on the lower slopes and in the more poorly drained situations the subsoil is mottled with gray, yellow, and brown. Under continuous clean cultivation the surface soil loses much of its humus supply and is gray or light grayish yellow.

Ruston fine sandy loam ranges in thickness from a very shallow covering on eroded slopes to 30 or more inches on gentle slopes and ridge crests. As mapped, this soil includes small areas of Norfolk fine sandy loam and Orangeburg fine sandy loam. On the surface of spots south of Grady near the county line there are a few angular iron sandstone gravel. Such areas resemble Kirvin fine sandy loam.

Ruston fine sandy loam occurs mainly in the southern part of the county. The largest areas are between Ramer and the south county line, about 2 miles west of Legrand, and east of Pine Level. The greater part of the soil occupies gently rolling country, but some areas are on comparatively low hills and ridges. Drainage is well established. Erosion is active on the steeper slopes and rolling areas. This soil absorbs and retains moisture well.

Probably 75 per cent of the land is cleared and under cultivation. The remainder supports a growth of old-field and shortleaf pines, together with a few longleaf pine, oaks, gums, and several other hardwoods.

Cotton, corn, velvetbeans, and peanuts are the principal crops, and oats, cowpeas, sorgo, sugarcane, and vegetables are minor crops grown for home use. Under boll-weevil conditions the yields of cotton vary greatly. The yield on tenant farms ranges from about one-eighth to one-third bale to the acre, but the landowners and better farmers of the county, through selection of early-maturing varieties and liberal application of high-grade commercial fertilizers, obtain one-half bale or more in good seasons. Corn yields from 10 to 20 bushels, the higher yields being obtained where nitrogenous fertilizers are used; velvetbeans, which are grown with the corn, give an average yield of about one-half ton; and yields of peanuts range from about 25 to 50 bushels to the acre. Better yields of crops of better quality can be obtained by liming and by

applying phosphoric acid. Sorghum, sugarcane, cowpeas, and potatoes yield fairly well.

Land of this kind sells at prices ranging from $10 to $30 an acre depending on improvements and nearness to towns.

Ruston fine sandy loam is well suited to general farm crops and truck crops. It is a mellow and very easily tilled soil and is sufficiently open and loose to allow a good circulation of both air and water. It responds readily to good treatment, to the addition of organic matter in the form of barnyard manure or green-manure crops, and to the application of commercial fertilizers.

Ruston fine sandy loam, hilly phase.—The hilly phase is separated from typical Ruston fine sandy loam on account of its hilly relief, which renders it unsuited to general farming, and on account of the mixed condition of the soils that are included. The surface soil and subsoil of the greater part of this soil are typical Ruston fine sandy loam. However, considerable variation in the color and depth of the soil occurs from place to place. On the crests of ridges the surface covering may consist of 30 or more inches of grayish fine sand, similar to Norfolk fine sand, and on the steep slopes the red subsoil may be exposed through erosion. On the lower slopes this soil usually grades into Susquehanna fine sandy loam or Susquehanna clay. In some places near the base of hills, erosion has exposed small spots of the calcareous marls of the Ripley formation, from which the heavier soils are derived. These variations and inclusions are so intricately mixed that separation into soil types could not be made on a small scale map.

Ruston fine sandy loam, hilly phase, occurs in comparatively small isolated areas mainly in the southern part of the county. The surface run-off of rain water is excessive, and erosion is active throughout all areas. This soil has a much lower agricultural value than the typical soil and is much more difficult to handle.

Probably 40 per cent of this land has been cleared, but only a very small part of it is now farmed. Only small patches on the hilltops and more gentle slopes can be cultivated. Forested areas support a growth of shortleaf pine, together with a few hardwoods. The land is best suited to forestry.

Table 6 shows the results of mechanical analyses of samples of the surface soil, subsurface soil, and subsoil of typical Ruston fine sandy loam.

TABLE 6.—*Mechanical analyses of Ruston fine sandy loam*

No.	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
416918	Surface soil, 0 to 4 inches	1.3	7.5	7.9	35.1	26.9	16.3	5.4
416919	Subsurface soil, 4 to 10 inches	1.0	7.5	7.4	36.4	26.6	18.1	3.2
416920	Subsoil, 10 to 40 inches	.6	4.0	3.8	22.6	18.7	21.0	29.6
416921	Subsoil, 40 to 72 inches	.1	.8	.7	20.2	17.3	25.9	35.0

ORANGEBURG FINE SANDY LOAM

In virgin areas the surface soil of Orangeburg fine sandy loam to a depth ranging from 1 to 3 inches consists of grayish-brown loamy sand containing a small amount of organic matter. It is

underlain by brownish-yellow or yellow loamy sand which continues to a depth varying from 10 to 18 inches. These two layers are mellow, friable, and of single-grain structure. The subsoil is red friable crumbly sandy clay, which continues to a depth ranging from 40 to 72 inches. Below this layer is mottled or streaked red and yellow hard but brittle material. In places the predominant color is red with streaks of yellow and light gray. In cultivated fields the surface soil to a depth ranging from 5 to 8 inches is light brown or brownish gray in color.

This soil is fairly uniform in color, texture, and structure, except where erosion or transportation of material has taken place. The deepest surface covering is on the more gentle slopes, whereas on the steeper slopes part of the surface soil has been removed and in some places only about 6 inches of soil material overlies the subsoil. On a few eroded "gall spots" the red fine sandy clay is exposed or has a very shallow covering.

Orangeburg fine sandy loam is an inextensive but a very desirable agricultural soil. A large part of the total area of this soil lies within the city of Montgomery, and a large tract is about 2 miles east of that city. Other important areas occur at and south of Mount Meigs and south of Waugh. Areas range from almost level to undulating and gently rolling, and some tracts near the stream heads are slightly hilly. Practically all the land lies favorably for cultivation, and over a large part of it modern farm machinery can be used advantageously. All areas are well drained, and on many of the steeper slopes the run-off is excessive. Terracing is necessary on most of the slopes to prevent surface wash and gullying.

Practically all this soil not included within the city of Montgomery is under cultivation. It is considered one of the best general-purpose soils in the county, and nearly all crops common to the region are grown. The same crops are grown and practically the same yields are obtained as on Greenville fine sandy loam, with which this soil is closely associated.

Farm land of this kind near Montgomery commands from $100 to $200 an acre. In other sections of the county prices range from about $15 to $50, depending on nearness to town and state of improvement.

This soil may be easily improved. One of its greatest needs is the addition of organic matter in the form of stable manure or green manure. Cowpeas, velvetbeans, and soybeans are excellent green-manure crops. Winter cover crops, such as oats, rye, bur clover, winter peas, and vetch, should be more generally grown to protect the fields from erosion. They furnish some winter pasturage and add considerable organic matter to the soil if plowed under in the spring. Deeper plowing would be beneficial, especially where green-manure crops are turned under.

Orangeburg fine sandy loam, gravelly phase.—The surface soil and subsoil of Orangeburg fine sandy loam, gravelly phase, are similar to those of the typical soil. They differ in that they contain a large quantity of rounded quartzite gravel. These gravel generally occur to less extent in the subsoil, although in a few locations they comprise from about 30 to 50 per cent of the subsoil material. The quantity of gravel varies from place to place, but it is nowhere

great enough to prohibit cultivation. Several small spots of Greenville fine sandy loam, in which the gravel content is negligible, are included with this gravelly soil in mapping.

This soil, which is inextensive, occurs in a few areas west of Antioch, where it occupies the crests and upper slopes of the hills. These hills are cut by numerous branch heads, and the surface runoff of rain water is rapid. Erosion is active over all areas.

The same crops are grown and practically the same yields are obtained as on typical Orangeburg fine sandy loam.

GREENVILLE FINE SANDY LOAM

To a depth of 3 or 4 inches Greenville fine sandy loam in wooded areas consists of dark-brown loamy fine sand containing a small amount of organic matter. This is underlain to an average depth of about 10 inches by reddish-yellow or yellowish-red loamy fine sand. Although most of the surface soil is friable, sufficient silt is present to make it somewhat coherent below a depth of an inch or two. Slight variations in the relative quantities of sand and silt exist from place to place, the more silty areas approaching loam in texture. The typical subsoil, to a depth ranging from 3 to 8 or more feet, consists of deep-red friable fine sandy clay of uniform color and texture, which has a rather high content of silt and clay and contains some rounded quartz gravel and iron concretions. The material, though slightly sticky when wet, is normally friable and crumbly, and its structure renders it very favorable to moisture retention. Beneath the subsoil is either streaked red and yellow hard compact but brittle sandy clay or yellowish-red sandy material filled with comparatively small rounded quartzite gravel.

In cultivated fields the surface soil is reddish-brown or brownish-red fine sandy loam, depending on the depth to the deep-red subsoil. The deepest surface covering is on the more gentle slopes, whereas on the steeper slopes part of the surface soil has been removed and in some places is only about 6 inches thick over the subsoil.

Included with mapped areas of Greenville fine sandy loam are several small tracts of Greenville clay loam, too inextensive to be separated. One small area is 1 mile southwest of Antioch, and several strips lie along the breaks just northeast of Montgomery. Here the soil is the result of erosion of Greenville fine sandy loam, whereas the tract near Antioch occupies a nearly level position. The surface material varies from red heavy loam to clay loam from 6 to 8 inches thick. The subsoil is darker in color and more silty than the typical soil.

Greenville fine sandy loam occurs only in the northern part of the county. The largest areas are east of Montgomery and south of Mount Meigs. The soil occurs in nearly level or undulating areas and on some low flat-topped hills with gently sloping sides. The relief is generally sufficient to insure good surface drainage, and the structure of the soil allows adequate internal drainage. This soil absorbs and retains moisture well and is one of the last upland soils to show the effects of drought.

The city of Montgomery is located in part on this soil, which is one of the most desirable in the county. Practically all the rest of the land is cultivated. It is suited to a variety of crops and can be made highly productive.

Cotton and corn, the chief crops, usually give satisfactory yields, cotton averaging about one-half bale and corn about 25 bushels to the acre. Commercial fertilizers liberally used invariably increase crop yields, particularly when the nitrogenous ingredients are high. The soil is also well suited to oats, cowpeas, velvetbeans watermelons, cantaloupes, sweetpotatoes, tomatoes, beans, radishes, beets, turnips, cabbage, collards, and a number of other vegetables. It is also well suited to peaches, pecans, figs, plums, grapes, and berries. The wide adaptation of this soil to fruits and truck crops and its nearness to Montgomery cause it to offer excellent opportunities for profitable returns.

Farm land of Greenville fine sandy loam has a selling price ranging from $75 to $200 an acre, depending on its nearness to Montgomery and on improvements.

To increase crop yields on this soil, it should be plowed to a depth of about 10 inches in the fall and seeded to some winter cover crop; liberal applications of stable manure should be made whenever possible; a crop rotation including leguminous crops to be plowed under every two or three years should be followed; and high-grade commercial fertilizers should be applied. Terracing of the slopes is necessary to prevent soil erosion.

KIRVIN CLAY LOAM

Kirvin clay loam is a red upland soil characterized by an abundance of brown or reddish-brown small rounded or flattened iron pebbles or concretions on the surface. The surface soil is either light-brown or reddish-brown clay loam 4 or 5 inches thick or light-brown or reddish-brown heavy fine sandy loam from 1 to 4 inches thick. The soil is sufficiently friable to cultivate easily. The subsoil to a depth of about 15 inches is dull-red or brownish-red compact but brittle clay containing a little coarse material. When wet it is plastic, but when dry or moderately moist it assumes a coarse granular structure. The lower part of the subsoil to a depth of several feet is commonly lighter colored and slightly plastic. Shades of reddish brown, yellowish brown, and yellowish gray prevail in most places, the color becoming lighter with depth. The subsoil contains some yellowish and brownish platy or shalelike small iron sandstone fragments, but they are not so numerous as in the surface soil and are softer and less angular. Kirvin clay loam is associated with the Susquehanna and Ruston soils and includes small areas of those soils.

Kirvin clay loam is inextensive. It occurs in the three southern townships of the county. Areas, in general, range from rolling to somewhat hilly, and a few along the heads of drainage ways occupy steep hillsides. Surface drainage ranges from good to excessive on the steep slopes. The soil retains moisture well, but prolonged saturation of the surface and subsurface layers never occurs.

Nearly all this soil is cleared and under cultivation. Much of it has been allowed to erode rather severely, with consequent loss of much of the more friable surface material, but with efficient cultivation a good state of tilth may be regained even in such places. The land is highly prized for cotton, and cotton is but little later maturing than on the sandy soils. The soil is better adapted to cowpeas and peanuts than to corn.

NORFOLK FINE SANDY LOAM

The surface soil of Norfolk fine sandy loam in virgin or wooded areas consists of dark-gray loamy fine sand 1 or 2 inches thick, passing into pale-yellow or grayish-yellow loamy fine sand which continues to a depth ranging from 10 to 20 inches. The typical subsoil of yellow friable fine sandy clay extends to a depth varying from 3 to 5 feet. This layer grades into mottled or streaked red, yellow, and gray, or brownish-red and yellow hard but brittle sandy clay. In cultivated fields, the surface soil to a depth varying from 5 to 10 inches is light-gray or grayish-yellow loamy fine sand. The color depends on the amount and character of organic matter present.

There is considerable variation in the depth of the surface soil from place to place. On the crests and slopes of some hills the subsoil is reached at a depth ranging from 24 to 36 inches. These spots represent Norfolk loamy sand or an approach to that soil. On some of the gentle slopes, bordering areas of Susquehanna fine sandy loam, the lower part of the subsoil is heavier than typical at a depth between about 36 and 40 inches and is abruptly underlain by heavy sticky yellowish mottled clay. In other places, as on the breaks or upper slopes, the surface soil is shallower, the subsoil is brownish mottled with red and gray at a depth of 16 or 18 inches, and the lower part of the subsoil is mottled red, gray, and yellow.

Norfolk fine sandy loam occurs mainly in the southern part of the county on the strata ridge.

The relief of areas of this soil is variable, ranging from nearly level, undulating, and gently sloping to hilly. The larger part of the soil has a generally smooth surface. In general, drainage is good, but in some of the flatter areas and in areas on some of the lower slopes which receive seepage water from above, the soil is rather poorly drained.

Norfolk fine sandy loam is not very extensive in Montgomery County, but it is a good agricultural soil. About 75 per cent of the land is cleared and under cultivation; the remainder supports a second growth, principally of shortleaf pine, with some longleaf pine, oak, hickory, and gum.

Cotton and corn are the principal crops, yields of cotton ranging from one-fifth to one-third bale and of corn from 10 to 20 bushels to the acre. Velvetbeans, soybeans, cowpeas, sweetpotatoes, potatoes, peanuts, and sugarcane are successfully grown, and most vegetables do well. Peanuts, cowpeas, and velvetbeans are planted by many farmers for hog and cattle feed, and late fall forage is obtained by planting velvetbeans with the corn or by sowing cowpeas or soybeans at the time of the last cultivation. Fertilizer gives good results, and the soil responds readily to manure.

The current selling price of this soil ranges from about $10 to $25 an acre in the southern part of the county and from $40 to $60 elsewhere.

Norfolk fine sandy loam is easily cultivated and is responsive to good farm practice. It has a wide crop adaptation but is particularly well suited to truck crops, peanuts, potatoes, cucumbers, and tobacco. The greatest need of the soil is the incorporation of organic matter. All available barnyard manure should be applied. Where the supply is small, winter cover crops of oats, rye, vetch, or summer legumes,

such as cowpeas, soybeans, and velvetbeans, should be used as green manure. In other parts of the State, in a series of experiments conducted to determine the needs of this soil, fertilizer applications of about 200 pounds of superphosphate, 100 pounds of kainit or other potash salts, and 100 pounds of nitrate gave the most profitable returns for cotton. Where near transportation lines, this soil could be profitably devoted to melons, potatoes, and other truck crops and garden vegetables. Applications of lime are beneficial.

NORFOLK FINE SAND

Norfolk fine sand under forest consists of gray, loose, fine sand from 2 to 4 inches thick, passing into grayish-yellow fine sand extending to a depth ranging from 6 to 10 inches, where it is underlain by pale yellowish-gray loamy fine sand continuous to a depth between 36 and 72 inches, beneath which depth is streaked yellow and dull-red compact but friable fine sandy clay.

Norfolk fine sand occurs in small areas scattered throughout the uplands in the southern part of the county, where it occupies crests of hills, ridges, and lower slopes. The relief varies from gently rolling to rolling. Drainage is thorough, and the soil is rather droughty for crops which do not mature early.

Practically all the Norfolk fine sand is cleared and under cultivation, principally to cotton and corn. Cotton yields about one-eighth bale to the acre and corn from 8 to 10 bushels. Yields of other crops are correspondingly low. However, when fertilizers and manure are applied the soil reacts readily, and yields are greatly increased.

Norfolk fine sand can be handled with light farm tools and can be cultivated under a wide range of moisture conditions, even directly after a rain. The soil warms up early in the spring and is well suited to truck crops and vegetables. It requires frequent shallow cultivations to conserve moisture. It must be fed constantly by large applications of manure and an occasional green-manure crop. A legume crop in the rotation and winter cover crops will assist in its maintenance and upbuilding. Under present economic conditions Norfolk fine sand is best suited to forestry.

AMITE SANDY LOAM

The surface soil of Amite sandy loam consists of reddish-brown or red medium or fine sandy loam from about 6 to 10 inches thick. It is mellow and ranges in texture from light sandy loam to fairly heavy fine sandy loam. The subsoil is red friable crumbly fine sandy clay to a depth ranging from 24 to 30 inches and grades into lighter-red and slightly more friable fine sandy clay which continues to a depth of several feet. Below this is the substratum of gravel and light-red sandy material. In some places this mixed material is reached between depths of 30 and 36 inches and in such places the subsoil is uniformly red friable fine sandy clay. Locally the gravel substratum is reached between depths of 3 and 10 feet. It may range in thickness from a few inches to several feet.

Included in mapped areas of Amite sandy loam are areas in which the surface soil is grayish brown or grayish yellow to a depth of about 6 inches where it grades into reddish-yellow loam or heavy fine sandy loam which in turn is underlain, at a depth ranging from 12 to 15 inches, by yellowish-red or bright-red friable fine sandy clay. These areas consist of Chattahoochee fine sandy loam and are not quite so productive as Amite sandy loam. About 2 miles northwest of Merry and about 3 miles east of Montgomery there are small areas of dark reddish-brown loam or heavy fine sandy loam underlain by dark-red rather heavy but friable yet slightly sticky fine sandy clay or clay loam which continues to a depth of several feet. These spots consist of Blakely loam but were not separated on the map on account of their small extent. Where Amite sandy loam adjoins areas of Cahaba fine sandy loam the surface soil is lighter in color and the subsoil is more reddish-yellow friable clay loam.

Amite sandy loam occurs in the northern part of the county. The largest areas are east of Montgomery, south of the Western Railway of Alabama, and along the same line west of Montgomery. Areas occupy the highest terraces of Tallapoosa and Alabama Rivers and lie well above overflows. They are nearly level or gently undulating, and drainage is good throughout. This soil resembles the Greenville soils of the uplands in many respects but differs from them in topographic position.

Amite sandy loam is one of the most desirable of the river-terrace soils, and practically all of it is under cultivation. It is an early soil and responds readily to good treatment. The land is easily worked and can be handled under a fairly wide range of moisture conditions. Crops withstand drought well, and the best yields, especially of cotton, are obtained in years of less than normal rainfall. By far the largest acreage of this soil is devoted to cotton. Generally enough corn is grown for home use on owner-operated farms, but on the average tenant farm enough corn for home needs is seldom grown. Oats, cowpeas, sweetpotatoes, and vegetables are produced to some extent.

Yields of cotton range from one-third to 1 bale to the acre, the larger yields obtaining in good seasons and where the land is fertilized with from 400 to 600 pounds of a mixture consisting of 200 pounds of superphosphate, 100 pounds of nitrate of soda, and 100 pounds of kainit or 25 pounds of muriate of potash. Corn produces from about 15 bushels to the acre with no fertilization, to about 40 bushels where 100 pounds of nitrate of soda to the acre is applied when the corn is about 2 feet high. Cowpeas produce from one-half to 1½ tons of hay to the acre and sweetpotatoes from 100 to 200 bushels. Yields of sweetpotatoes ranging from 300 to 500 bushels are obtained by applying from 600 to 800 pounds of 4–8–4 fertilizer to the acre.

Amite sandy loam sells at prices ranging from $100 to $200 an acre, depending on the improvements and nearness to Montgomery.

Amite sandy loam is one of the best general-farming soils in the county. It is suited to a wide variety of staple and special crops, such as corn, wheat, oats, cowpeas, velvetbeans, soybeans, peanuts, crimson clover, and bur clover. It has been recognized as one of the best cotton soils in the county and is well suited to the pro-

duction of cotton under boll-weevil conditions. By applying lime and inoculating the soil, alfalfa can be successfully grown. This soil is well suited to truck crops such as sweetpotatoes, potatoes, tomatoes, onions, cucumbers, and lettuce. It is one of the best peach and pecan soils in the county.

Amite sandy loam, sink phase.—The surface soil of Amite sandy loam, sink phase, varies in color from brown to dark reddish brown and in texture from loam or silty loam to fine sandy loam. It varies in thickness from about 20 to 30 inches and generally grades into brown sticky fine sandy clay mottled with gray and rust brown.

Soil of this phase occurs as sinks or swales and along small drainage heads. It consists of material washed down from the Amite, Cahaba, Greenville, Orangeburg, and Ruston soils. Water stands in some of the sinks several days after heavy rains, but drainage is fairly good over most of the areas. The soil occurs in a number of small areas, principally on the terraces of Alabama River in the northern part of the county.

A much ranker vegetation grows on this than on adjoining soils. Corn and oats are the principal crops, and they return good yields. Near Montgomery some of the land is used for truck crops such as cabbage, beans, beets, radishes, onions, tomatoes, lettuce, and turnips, which give profitable returns.

CAHABA FINE SANDY LOAM

To an average depth of about 8 inches Cahaba fine sandy loam consists of brown mellow fine sandy loam. The subsoil is brownish-red or yellowish-red firm but friable fine sandy clay, which passes gradually at a depth of about 24 inches into slightly lighter-red and more friable fine sandy clay, continuous to a depth of several feet. In most places, underlying the subsoil at a depth ranging from 4 to 6 feet is a substratum of reddish-yellow sand filled with comparatively small rounded quartzite gravel. Locally the subsoil is rather compact and brittle.

Some variations occur in mapped areas of this soil. The thickness of the surface soil ranges from about 6 to 15 inches, the shallower areas, in which the surface soil has been partly removed through erosion, occurring on the slight knolls and breaks to lower-lying soils. Here the surface soil is more reddish than typical and approaches loam in texture. The subsoil is rather uniform to a depth of several feet. Cahaba fine sandy loam occurs in close association with Kalmia fine sandy loam and Amite sandy loam and includes small areas of those soils.

Cahaba fine sandy loam is an alluvial soil. It occurs mainly in irregular-shaped areas of various sizes over the older terraces of Tallapoosa and Alabama Rivers. A few small scattered areas lie along some of the larger creeks in the north-central part of the county. Areas range from level to undulating, and drainage is well established in most places. The structure of the material, which allows ready internal movement of soil moisture, aids materially in establishing proper moisture conditions. This is a very desirable soil and may be put in good tilth under a rather wide range of moisture conditions.

Practically all the land is cleared, and about 80 per cent of it is under cultivation, mainly to cotton and corn. The remainder is in old fields or pasture. Cowpeas, velvetbeans, and oats are grown to some extent for forage, and patches of sugarcane are grown for the manufacture of sirup for home use. Sweetpotatoes, vegetables, and melons are produced in sufficient quantities for home use. Small tracts of this land near Montgomery are used for trucking.

Cotton produces from one-third to three-fourths bale to the acre, the higher yields obtaining where about 400 pounds to the acre of high-grade fertilizer is applied. Corn yields from 15 to 25 bushels to the acre. This crop is not generally fertilized, but some farmers obtain profitable results by applying about 100 pounds of nitrate of soda to the acre when the corn is about 2 feet high. Oats yield from 15 to 30 bushels, or when cut for hay from about 1 to 1½ tons to the acre; sugarcane from 100 to 200 gallons of sirup; and sweetpotatoes about 150 bushels. Where highly fertilized the last two crops give much larger returns.

The current selling price of Cahaba fine sandy loam ranges from $25 to $100 an acre, the higher prices obtaining near Montgomery.

The productiveness of this soil can be easily maintained by good farming methods. The incorporation of organic matter, deeper plowing, more thorough preparation of the seed bed, and the rotation of crops are its chief requirements. Permanent pastures should be seeded to a mixture of Bermuda grass, Lespedeza, bur clover, and white clover.

Cahaba fine sandy loam is an excellent general-farming soil. It offers good opportunities for general farming and the production of medium or late truck crops. It is suited to corn, oats, rye, soybeans, velvetbeans, cowpeas, sorgo, and sugarcane and is a fairly good cotton soil under boll-weevil conditions. A great variety of vegetables, such as potatoes, sweetpotatoes, tomatoes, peppers, okra, squash, cucumbers, string and Lima beans, radishes, and lettuce do well and could doubtless be profitably grown for market. The soil is also well suited to pecans, peaches, bush fruits, and strawberries. The greater part of the land is favorably located with respect to shipping facilities.

Cahaba fine sandy loam, mixed phase.—The mixed phase of Cahaba fine sandy loam includes small spots of Cahaba, Kalmia, and Augusta soils, together with gradations from one soil to the other, so intricately mixed that separations could not be made on a small-scale map. The Cahaba soils predominate. The texture of the material ranges from clay loam through silt loam to fine sandy loam. The lighter material, which is generally shallower than in the typical soil, predominates. Plowed fields present a very spotted appearance, the color ranging from light gray in depressions to brown or reddish on the slight ridges.

Areas of this mixed soil are generally level but include numerous slight ridges and depressions. The Cahaba soils occupy the ridges, and gradations to the Kalmia and Augusta soils are in the depressions. Drainage is fairly good on the ridges and poor in the depressions where water usually stands for several days after heavy rains. Soil of this phase occurs in small areas on the Tallapoosa and Alabama River terraces in association with the Cahaba, Kalmia,

Augusta, and Leaf soils. The most important areas are west of Montgomery.

The greater part of this mixed soil is under cultivation, corn and oats being the principal crops. Yields of these crops are practically the same as on Cahaba fine sandy loam. Some cotton is grown with fair or good yields in favorable seasons.

CAHABA LOAMY SAND

The surface soil of Cahaba loamy sand is brown or dark-brown loamy sand or medium fine sand from 8 to 10 inches thick. The subsoil is brown or light reddish-brown loamy sand which extends to a depth of several feet, commonly becoming more loamy and more reddish with depth.

Included with this soil in mapping are several areas of Cahaba sand. Such areas are 2 miles north of Mitylene and 2 miles west of Mount Meigs. Here the surface soil of brown sand or medium sand is underlain by light-brown or light reddish-brown sand. The soil is loose, incoherent, and of little more value than river wash. It has been cleared of the tree growth but is not cultivated at present.

Cahaba loamy sand occurs in comparatively small areas on the terraces of Alabama and Tallapoosa Rivers. The land occupies low ridges or hummocks, most of which lie slightly higher than the surrounding soils. Drainage is thorough. The soil absorbs water readily and is more retentive of moisture than the included sand.

The greater part of the Cahaba loamy sand is under cultivation. It is a light, warm soil and is devoted chiefly to corn, velvetbeans, peanuts, and cotton, which produce from fair to good yields, depending on the supply of humus in the soil and the amount and kind of fertilizer applied.

Cahaba loamy sand can be handled with light farm tools and can be cultivated under a wide range of moisture conditions, even directly after a rain. It warms up early in the spring and is well suited to truck crops and garden vegetables. Large applications of manure and frequent shallow cultivations are necessary to conserve moisture. The organic matter must be constantly replenished, and an occasional green-manure crop should be turned under.

KALMIA FINE SANDY LOAM

Kalmia fine sandy loam to a depth ranging from 5 to 8 inches consists of fine sandy loam or loamy fine sand. This is underlain by light grayish-yellow or pale-yellow loamy fine sand which continues to an average depth of about 16 inches. These two layers have a single-grain structure, fine sandy texture, and mellow consistence. The subsoil of light-yellow or yellow fine sandy clay extends to a depth of several feet. It is firm but friable and becomes mottled with gray, shades of yellow, and brown at a depth ranging from 30 to 40 inches. The subsoil passes gradually into streaked gray, yellow, and dull-red compact sticky fine sandy clay.

The thickness of the surface soil varies considerably, but the subsoil is almost everywhere reached at a depth of less than 30 inches. In a few more poorly drained situations the soil is darker in color,

and the subsoil is more mottled than typical. After a few years of clean cultivation, the surface soil loses much of its humus and becomes light gray in color.

Kalmia fine sandy loam is closely associated with soils of the Leaf, Cahaba, and Amite series and includes small areas of these soils. In the areas on the Tallapoosa River terrace, the surface soil is light grayish brown, and the subsoil has a brownish-yellow cast and contains considerable finely divided mica flakes. Here the soil is generally better drained and has a slightly higher agricultural value than areas of this soil lying south of the prairie belt.

Kalmia fine sandy loam occurs on both the river and smaller stream terraces. A number of comparatively large areas lie between the Western Railway of Alabama and the Seaboard Air Line Railway, between Montgomery and the eastern county line. Other areas, ranging in size from a few to 200 or more acres, lie along the stream terraces of practically all the larger creeks in the county.

This soil occupies level or nearly level stream terraces which, although representing former stream flood plains, are not subject to overflow except during times of exceptionally high water when the lower strips may be inundated. Kalmia fine sandy loam has the same range of crop adaptations as Norfolk fine sandy loam. The material of the Kalmia soil rather closely resembles that of Norfolk fine sandy loam, but it is more retentive of moisture. The more poorly drained areas of this soil require ditching and tiling.

Practically all the Kalmia fine sandy loam is cultivated. It is used almost exclusively for general-farming purposes. Cotton and corn are the principal crops. The soil is probably better suited to corn, although a greater acreage than formerly is now planted to cotton. The soil is inclined to be late, and in many seasons the cotton crop is cut short by damage from boll weevils. If the soil is plowed deeply there is less danger from drought with this than with many other soils in Montgomery County. The land holds fertilizer well and responds readily to its use. Velvetbeans, cowpeas, oats, peanuts, sorgo, and sugarcane are crops of minor importance.

Yields of corn range from 10 to 30 bushels, averaging about 12 bushels to the acre. The higher yields are obtained where soil-improvement crops are grown or where nitrate of soda or stable manure is applied. About one-half bale of cotton to the acre is produced by some farmers on this soil. Cowpeas and velvetbeans are usually planted in the corn and give good returns. Sorghum and sugarcane give from fair to good yields, and a good quality of bright-colored sirup is produced. A good grade of tobacco is grown on this soil in some parts of southern Alabama. Numbers of large orchards of pecans are planted on this soil in the counties to the south of Montgomery County. Potatoes, peanuts, and vegetables should give profitable returns.

Deep plowing, thorough tillage, an increase in the organic-matter supply, and the adoption of systematic crop rotations to include legumes will maintain and in many cases increase the productiveness of Kalmia fine sandy loam. The less perfectly drained areas would be materially improved by ditching. The soil is easy to handle and responds favorably to fertilization and good treatment. In addition to the crops now grown it is suited to Bermuda grass, Lespedeza, and other grasses and forage crops.

LEAF SILTY CLAY LOAM

The surface soil of Leaf silty clay loam consists of light-gray or gray heavy silt loam or silty clay loam, in some places slightly mottled with rust brown, and averaging 5 inches in thickness. The subsoil to a depth ranging from about 14 to 18 inches is light brownish-yellow or pale-yellow heavy silty clay loam or silty clay slightly mottled with gray and brown. On drying, this material breaks into angular lumps varying from very small particles to an inch or more in diameter. Below the subsoil and extending to a depth varying from 30 to 40 inches is light-gray heavy impervious plastic silty clay mottled with red, yellow, and brown. This cracks and breaks into irregular lumps on drying. In most places light-gray or almost white heavy smooth silty clay mottled with yellow and yellowish brown lies below a depth of 40 inches, and this material is underlain in places by light-gray silty clay blotched or streaked with brownish-yellow fine sandy material of friable consistence. In many places, especially on the river terraces, yellow fine sand is reached at a depth of 12 or 15 feet. In some places the bright-red mottles are more conspicuous in the upper part of the subsoil than in the lower part. This soil includes small areas of silt loam and fine sandy loam. Small yellow and brown rounded soft iron accretions are present in most places on the surface and throughout the soil. They are more numerous in the depressions or poorly drained areas.

Leaf silty clay loam is a terrace soil occurring along the rivers and creeks. The largest areas are 1 mile north of Montgomery and near Mount Zion. The soil lies from 20 to 60 feet above normal water level, but some of it is occasionally covered with water during abnormally high floods. The surface varies from level to slightly undulating, and natural surface drainage is generally poor. The dense consistence of the subsoil greatly retards the movement of moisture downward. In some of the flatter and lower-lying areas water remains on the surface for considerable periods. Ditching is necessary for adequate drainage.

Leaf silty clay loam is one of the less extensive soils of Montgomery County and is not very important agriculturally. Probably about 20 per cent of the land is under cultivation at present. A large part which was formerly cultivated has been abandoned, owing to the impossibility of producing cotton successfully under boll-weevil conditions. The old fields now support a growth of broom sedge, crabgrass, carpet grass, and Lespedeza and are used principally for pasture. The forested areas support a growth of old-field pine, sweetgum, black gum, water oak, and a few other hardwoods. Near Montgomery the soil is used to some extent in the manufacture of brick and tile.

Corn and oats are the principal crops grown. Corn produces from 10 to 15 bushels to the acre, and oats yield from 15 to 40 bushels, the higher yields obtaining where applications of about 100 pounds to the acre of nitrate of soda are given. The yield of cotton is uncertain on account of destruction by weevils, the average yield being about one-fifth bale to the acre.

Land of this kind can be considerably improved by providing adequate drainage, adding organic matter, plowing deeply, and thor-

oughly preparing the seed bed. Where properly drained, small grains, pasture and hay grasses, forage crops, and corn can be produced.

LEAF FINE SANDY LOAM

The surface layer of Leaf fine sandy loam is gray fine sandy loam about 7 inches thick. It is loose and mellow and has a single-grain structure. It is underlain to a depth ranging from 15 to 18 inches by mellow pale-yellow loamy fine sand which gradually becomes heavier, more loamy, and of deeper color as the subsoil is approached. The subsoil is yellow clay containing some fine sand mottled with red and gray or is mottled yellow, red, and gray. The material is sticky and plastic when wet but crumbles into a coarse nut structure when dry. The subsoil is underlain, at a depth ranging from 30 to 36 inches, by gray heavy tough plastic clay which is mottled with shades of red and yellow. In some places the mottled subsoil is much nearer the surface than in typical areas, being reached by the plow in a few locations. In the most poorly drained flat or depressed situations the color of much of the surface soil is dark gray on account of the high content of decaying vegetable matter. Such areas require artificial drainage before they can be used to advantage. Under continuous clean cultivation the surface soil soon loses its humus, becomes light gray, and shows a tendency to bake and run together. This soil is closely associated with Kalmia fine sandy loam and Leaf silty clay loam and includes small areas of those soils.

Leaf fine sandy loam occurs on the terraces of all the larger creeks in the county, with the exception of those in the prairie section. The largest areas occur along Catoma, Sandy, Baskin, and Dry Creeks in the central part of the county and along Line Creek in the eastern part.

Areas range from nearly level to slightly undulating. Natural surface drainage over a large part of the land is poor, and internal drainage is slow. The land lies only from about 10 to 20 feet above the first bottoms. In some of the flatter and lower-lying areas water remains on the surface for considerable periods. Ditching is necessary for adequate drainage.

Leaf fine sandy loam is rather extensive in Montgomery County. Probably 60 per cent of the land has been cleared, and from 40 to 50 per cent of it is now under cultivation. The wooded areas support a second growth of shortleaf pine, water oak, white oak, red oak, hickory, and sweetgum. Cotton and corn are the principal crops. Velvetbeans, cowpeas, sorgo, oats, and sweetpotatoes are crops of less importance. Corn produces from 10 to 15 bushels to the acre without fertilization, but where given an application of about 100 pounds to the acre of nitrate of soda when the corn is about 2 feet high the yields are higher. The yield of cotton is generally small. Where fertilized with 400 to 600 pounds to the acre of high-grade fertilizer, one-half bale or more is obtained in favorable seasons. Velvetbeans planted with corn produce from one-half to three-fourths ton to the acre, cowpeas yield from one-half to 1 ton of hay, and sweetpotatoes from about 60 to 150 bushels. Sorgo produces from 75 to 100 gallons of sirup to the acre.

This soil is fairly easy to work. The best yields are obtained in seasons of less than normal rainfall. Crops generally make a slow growth in the spring and mature considerably later than on the Kalmia and Cahaba fine sandy loams. This soil is earlier, however, than Leaf silty clay loam.

The productiveness of this soil can be increased by thorough ditching and underdrainage, liming to improve the physical condition, incorporation of organic matter by applying manure or turning under green crops, and deep fall plowing.

AUGUSTA SILT LOAM

The surface soil of Augusta silt loam to a depth of 6 inches consists of compact, single-grain or mellow grayish-brown silt loam mottled with rust brown. The subsoil to a depth ranging from 18 to 24 inches is pale-yellow, moderately compact but friable micaceous silty clay mottled with yellowish brown. This passes into yellow, compact brittle micaceous silty clay, mottled dull red, grayish yellow, and dark brown. The material of this layer has a fine cloddy structure and does not break up into a granular condition so readily as the overlying layer. Below a depth ranging from 36 to 48 inches the material is more compact, moderately plastic, and yellowish brown streaked with gray. The darker coloration in the surface soil and subsoil is contributed by soft brownish and black iron accretions. These accretions are most numerous in the more poorly drained areas.

Augusta silt loam is rather inextensive and is unimportant agriculturally. It occurs only on the Alabama and Tallapoosa River terraces. The largest areas are in the vicinity of Hunter, north of Montgomery, and north of Madison. Areas are generally flat or slightly depressed and lie slightly lower than adjacent soils. On account of the nearly level surface the run-off of rain water is slow. The surface soil and upper part of the subsoil absorb and retain water readily, but the compact lower part of the subsoil hinders the downward movement of moisture. Here the material was found to be lumpy and dry even after several weeks of extreme saturation of the surface soil. Some areas of this soil are overflowed during periods of extremely high water.

Probably 80 per cent of the land is cleared but only about 10 per cent is in cultivation, the remainder being in pasture and open fields. The wooded areas support a growth of oak, gum, elm, maple, haw, and pine. Corn and oats are the principal crops. Yields of corn range from about 10 to 25 bushels to the acre, and oats produce from 20 to 30 bushels. Formerly much of this soil was planted to cotton, but under boll-weevil conditions the returns are unprofitable. Bermuda grass, Lespedeza, crabgrass, water grass, and carpet grass furnish fairly good pasturage.

MYATT SILT LOAM

The surface soil of Myatt silt loam to a depth of 6 or 8 inches is gray or dark-gray silt loam specked with rust brown. The subsoil is pale-yellow or grayish-yellow silt loam mottled with gray, yellow, and rust brown. This layer becomes lighter in color at a depth ranging from 18 to 24 inches and is gray or bluish-gray silty clay mottled with shades of yellow and rust brown.

Many variations in color and texture occur in mapped areas of Myatt silt loam. In semiswampy areas, owing to an accumulation of vegetable matter, the surface soil is almost black. In other places it is very light gray, and in a few areas adjacent to areas of the Greenville or Amite soils, the wash from these areas gives the soil a brown color and sandy texture. A border of fine sandy material is usually present in areas of this included soil, especially where it is surrounded by sandy soils. Here the texture of the subsoil varies from silt loam or silty clay to fine sandy clay.

Several small areas of fine sandy loam are also included in mapping. These areas are similar in color to the typical silt loam but differ from it in that the texture of the surface soil is lighter and that the subsoil contains more fine sand.

Myatt silt loam occurs in a number of low, flat, nearly level small areas on Alabama and Tallapoosa Rivers. Drainage is very poor, and the soil remains saturated during the greater part of the year.

Nearly all the Myatt silt loam is in woodland. It supports a growth of bay, willow, sweetgum, cypress, loblolly pine, and other water-loving flora. The most economical use of this soil is for forestry. If drained it would furnish fairly good pasturage for about 6 or 8 months in the year.

Myatt silt loam has little value and is sold in conjunction with adjoining soils.

BELL CLAY

The surface soil of Bell clay is dark grayish-brown or almost black clay to a depth of about 10 inches. It is sticky and plastic when wet but assumes a coarse granular or nut structure when dry. The surface of plowed fields has a dark-brownish cast. The subsoil to a depth ranging from 24 to 30 inches is gray or dark-gray sticky plastic clay mottled with rust brown and yellow. Below this depth the material is brownish-yellow and gray sticky plastic clay which is abruptly underlain by the yellowish, whitish, and grayish calcareous parent material. The surface soil is calcareous or neutral whereas the subsoil in many places, especially in the more poorly drained situations, is decidedly acid. Along many of the small stream heads adjoining areas of Sumter clay, the material is calcareous from the surface downward and the subsoil is less mottled than typical. In the more poorly drained locations the soil is lighter in color and mottled with rust brown, and the subsoil passes quickly into mottled gray, rust-brown, and yellow, heavy, plastic clay. The surface soil, in places, is clay loam or loam, and layers of fine sand from 1 to 6 inches thick occur in some areas in the subsoil at various depths.

Bell clay is an extensive soil in Montgomery County. It occurs along the smaller drainage ways in the prairies and as a terrace border in places along Pintlalla, Catoma, and some other creeks flowing through the prairie section. It represents transported material that has been washed down mainly from the Sumter and Oktibbeha soils. Though it generally lies above normal overflow of the streams it constantly receives thin sheets of water from the adjacent upland slopes. The surface is flat or gently sloping stream-

ward. Surface drainage is fairly good on the gentle slopes and poor on the flat areas, but the heavy texture of the subsoil retards internal drainage.

About 85 per cent of the Bell clay has been cleared, and the remainder supports a tree growth similar to that found on Catalpa clay. The greater part of the land is used in the production of hay, only about 20 per cent being used for cultivated crops. Formerly cotton was extensively grown, but since the advent of the boll weevil corn and Johnson-grass hay have become the important crops. Small acreages are planted to oats and sorgo, and some of the land is used for pasture. Yields of corn range from 20 to 50 bushels, averaging about 30 bushels to the acre. Three cuttings of Johnson grass are usually obtained, the total yield ranging from 1½ to about 3 tons to the acre. Sorgo produces from 100 to 200 gallons of sirup to the acre or from 6 to 8 tons of silage. Oats produce from 20 to 60 bushels, with an average of about 30 bushels to the acre. Peas, velvetbeans, and soybeans do well. Johnson grass, Bermuda grass, carpet grass, Dallis grass, and Lespedeza, together with several varieties of clover, furnish good pasturage for about 10 months in the year. This soil is one of the best grain and grass soils in the county and gives good returns of these crops without the use of fertilizer. Where tile drained, it is also well suited to the production of alfalfa. In Greene County an area of this soil which has been tile drained and planted to alfalfa has produced from 3 to 4 tons of hay to the acre yearly for a period of seven years.

Land of this kind is usually sold in conjunction with adjoining soils. It increases their value.

Bell clay is similar to Houston clay in many respects, and recommendations for the improvement of that soil apply equally well to this. Better drainage can be had by digging ditches to take off the surface waters, and protection from sheet water may be obtained by ditching along the base of the upland slopes.

WICKHAM FINE SANDY LOAM

In wooded areas the surface soil of Wickham fine sandy loam is brown loamy fine sand to an average depth of about 6 inches. The first inch or two is slightly darker and contains a little more organic matter. It carries a high percentage of silt and is mellow. The subsoil consists of light yellowish-red, reddish-brown, or light-red silty clay. This layer is moderately compact but brittle, breaking down to a coarse granular structure. It grades, at a depth ranging from 15 to 30 inches, into lighter-red brittle silty clay mottled with shades of red, gray, yellow, and rust brown. It is slightly more compact but more friable than the overlying layer. The surface soil and subsoil generally hold a rather high content of finely divided mica particles which, in most places, become more numerous with depth. Small rounded soft brownish and black iron accretions are conspicuous in many places on the surface and to less extent through the soil. They are most numerous in the swales or more poorly drained areas.

In cultivated fields the color of the surface soil ranges from light grayish yellow to reddish yellow or reddish brown. This layer is

consistently shallow, ranging in depth from about 4 to 8 inches. The texture varies from fine sandy loam to loam or mellow silt loam. Spots of yellowish-red clay are conspicuous in plowed fields.

Included with mapped areas of this soil are several small patches of silt loam and silty clay loam. These areas occupy depressions or lower situations than the typical soil. They contain different proportions of very fine sand and invariably carry a higher content of mica flakes than the typical soil. The subsoil is lighter in color and more mottled than typical but has practically the same structure as the typical subsoil.

This soil occurs on low terraces of Alabama and Tallapoosa Rivers. Most of it lies above normal overflows, but practically all of it is inundated by abnormally high floods. It is closely associated with areas of Augusta silt loam. The surface ranges from nearly level to gently undulating. Drainage is fairly good, except in the low swales, averaging better than in Augusta silt loam.

Wickham fine sandy loam is not very extensive, but it is practically all cleared and under cultivation. Corn, oats, and grasses are the principal crops, and yields are slightly higher than on Cahaba fine sandy loam. Some cotton is grown with fair results.

CONGAREE SILT LOAM

The surface soil of Congaree silt loam, to a depth ranging from 10 to 15 inches, consists of dark-brown silt loam. It has a single-grain structure, silty texture, and friable consistence. The subsoil of light-brown heavy silt loam or silty clay extends to a depth of several feet. It is heavier in texture and more compact than the surface soil and breaks down into fine granular lumps. There are slight variations in the texture of the surface material, which ranges from very light to very heavy silt loam. The lighter-textured areas are generally found in the higher positions where a greater quantity of very fine sand is present. The heavier phases occur in the lower depressions and have a slightly darker color and a texture which in many places approaches silty clay loam. Large quantities of finely divided mica flakes are present in both the surface soil and subsoil. On the knolls and ridges the soil takes on a decided tinge of red, approaching Cahaba silt loam.

Congaree silt loam is a recent-alluvial soil which is still in process of formation as it is subject to overflow. It occurs in the river bends and as marginal strips in the lower-lying areas adjacent to the rivers.

The surface ranges from level to undulating or hummocky and there are many small knolls, ridges, gentle depressions, and sloughs. Drainage is fairly well established over some areas, although the soil absorbs much water and holds it for long periods. Percolation is slow, but the natural relief is in most places sufficient to dispose of excessive rainfall without washing. Some of the lower depressions would be helped by artificial drainage.

Only about 40 per cent of this soil is cleared and under cultivation. The remainder is in forest consisting principally of sweetgum, black gum, cypress, maple, beech, water oak, cottonwood, elm, and a scattered growth of swamp pine. Switch cane constitutes the principal undergrowth.

Congaree silt loam is valuable in the production of corn, a large acreage being devoted to that crop. Under favorable conditions, corn yields from 30 to 75 bushels to the acre. Maximum yields of more than 90 bushels have been reported. Probably between 40 and 50 bushels is a fair average. No fertilizers are used. Oats do well, though very few farmers grow oats on this soil, as damage from overflow is likely to occur. Sugarcane and sorgo thrive, sorgo producing 150 gallons of sirup to the acre and sugarcane as much as 400 gallons.

Congaree silt loam is the most fertile soil in Montgomery County. Its fertility is maintained by annual additions of rich sediments carried from higher-lying soils. The natural fertility is attested by the dense growth of cane, even where the soil is not cultivated. The canebrakes afford excellent winter pasturage for cattle. The late spring rains and floods often delay planting on the lower areas, but the delay is never long enough to prohibit the planting of corn. Occasionally, a late-summer or fall flood destroys the corn.

Land of this kind commands from $20 to $50 an acre when sold in conjunction with adjoining soils.

No fertilizers are used and no system of crop rotation is attempted. To insure the best results it is necessary to plow the land deep and reduce it to a mellow, well-pulverized seed bed before planting the crops. This renders the well-drained areas loose and warm.

CONGAREE FINE SANDY LOAM

The surface soil of Congaree fine sandy loam to an average depth of about 10 inches is brown, mellow, loamy fine sand. It is underlain by either light-brown friable fine sandy loam or silty clay loam which extends to a depth of several feet. Both surface soil and subsoil carry considerable finely divided mica. In slight depressions and along contacts with Congaree silt loam, the proportion of silt increases. The subsoil in such places is very silty and has a slightly reddish cast. As with most alluvial soils, this soil includes minor variations. The texture may range from mellow fine sandy loam to loamy sand. In some areas the light loamy sand continues to a depth ranging from 18 to 24 inches and rests on a material identical with that forming Congaree silt loam. Some small included strips along the stream banks are composed of grayish-brown loose loamy sand which continues to a depth of 4 or 5 feet.

Congaree fine sandy loam is of little agricultural importance in this county because of its small extent. It occurs in small areas along Alabama and Tallapoosa Rivers, usually bordering the stream channel. The relief ranges from level to undulating or slightly ridgy. This soil lies slightly higher than the silt loam type of the Congaree series, and drainage conditions are usually well established. This is a very desirable bottom-land soil, as little difficulty is experienced in handling it and it responds readily to fertilization.

Cotton and corn, the principal crops, return good yields. The light texture of the material renders this a suitable soil for growing sweetpotatoes, watermelons, cantaloupes, peanuts, sugarcane, and vegetables.

Congaree fine sandy loam is sold with adjoining soils.

OCHLOCKONEE CLAY LOAM

The surface soil of Ochlockonee clay loam consists of grayish brown clay loam about 7 inches thick. It is plastic when wet but crumbles into a coarse granular structure when dry. The subsoil is brownish-gray sticky heavy clay, mottled with shades of brown, yellow, and gray, the gray coloring becoming more conspicuous with depth. Below a depth of about 40 inches the material consists of impervious gray and bluish heavy clay, less conspicuously mottled than the subsoil above. Considerable variation in the surface material exists. In places it has a high content of organic matter giving it a dark-brown color, and in other places the texture is fine sandy loam or clay. Layers of fine sand from 2 to 6 inches thick are common at various depths in the subsoil.

Included with mapped areas of this soil are several small areas of Ochlockonee fine sandy loam. This soil is similar to the clay loam in color but differs in that the surface soil is fine sandy loam, and the subsoil also is usually lighter textured.

Ochlockonee clay loam occurs along some of the creeks and branches in the southern part of the county. It is an alluvial soil, occupying the first bottoms, and represents material washed from the uplands and deposited along the streams during periods of overflow. The surface is flat or very gently undulating. Drainage is slow and, especially in the swales, is imperfect.

This soil is rather inextensive. The greater part of it is in forest and supports a rather dense growth of water-loving trees common to the bottom lands. It is an excellent soil for corn, sorgo, hay, and grasses. Corn produces from 20 to 40 bushels, with sometimes even higher yields in good seasons; sorgo produces from 75 to 150 gallons of sirup; and Johnson grass yields from 1½ to 3 tons of hay to the acre. A luxuriant growth of native grasses, such as Johnson grass, Lespedeza, Bermuda grass, and carpet grass, affords excellent grazing for cattle in the open fields. The wooded areas furnish good fall pasture for cattle if there is a growth of switch cane.

CATALPA CLAY

The surface soil of Catalpa clay in wooded areas is dark grayish-brown clay from 6 to 8 inches thick. It is stiff and waxy when wet, but assumes a coarse granular or nut structure on drying. The subsoil, which extends to a depth of several feet, is drab or dark grayish-brown clay, mottled with shades of yellow, brown, and gray. The surface soil is generally calcareous, but the subsoil is decidedly acid in most places.

This soil varies considerably in different localities. In some places the surface soil is loam or silty clay loam with included spots of fine sandy loam. Layers of sand or fine sand from 2 to 8 inches thick occur at various depths in the subsoil. In places along Pintlalla Creek the dark-brown clay surface soil is underlain by several feet of grayish-yellow sticky sandy clay. The color of the surface soil ranges from gray or greenish yellow to reddish brown, varying with the proportion of sediment contributed by the Sumter and Oktibbeha soils, respectively.

Catalpa clay occurs in bottoms along streams which head in or flow through limestone soils. It occupies abandoned stream channels.

cut-offs, and swales in places. The surface is predominantly flat. This soil is overflowed to a considerable depth at least once each year. Surface drainage and internal drainage are imperfect, owing to the flatness of the surface and the imperviousness of the surface soil and subsoil. Plowing and seeding are sometimes delayed by spring overflows, and cultivation may be retarded by heavy rains during the summer.

The largest areas of Catalpa clay occur on Catoma, Ramer, and Pintlalla Creeks. Probably 40 per cent of the land has been cleared, but only about 20 per cent of the cleared land is now cultivated; the remainder is in pasture, hay land, and forest. The tree growth consists mainly of sweetgum, water oak, willow oak, elm, ironwood, maple, ash, hackberry, cottonwood, and sycamore. The undergrowth is switch cane, palmetto, ragweed, poison oak, and briers.

Cotton was formerly grown extensively on this soil, but since the advent of the boll weevil corn is the principal crop. Some cotton is still grown, but the crop matures late and the yields are uncertain and generally small. The yield of corn ranges from 20 to 50 bushels, with an average of about 30 bushels, to the acre; Johnson grass, the principal hay grass, produces from 1½ to 2½ tons; and oats, which are grown on small areas where the winter rains are least damaging, yield from 20 to 40 bushels. Sugarcane and sorgo are grown in a small way for home use. The yields of sirup are good, but the product is darker in color and inferior in quality to that produced on the lighter-textured soils.

Johnson grass, Lespedeza, and Bermuda grass, together with several varieties of clover, are the principal pasture grasses. These grasses furnish good grazing from early spring until late fall. In the wooded areas switch cane and other undergrowth furnish fairly good winter pasture.

Improved Catalpa clay commands from $20 to $50 an acre. The unimproved areas are valued principally for the timber growth.

More thorough preparation of the seed bed is needed on Catalpa clay. The cultivated areas should be rotated with hay and pasture grasses, in order to receive the benefit of sedimentation from overflow waters. Better drainage and more efficient protection from overflows could be obtained, with the cooperation of the landowners, by constructing main ditches and levees. Catalpa clay is well suited to the crops commonly grown in Montgomery County. Where properly drained and protected from overflows it is also suited to alfalfa.

GUIN SOILS (UNDIFFERENTIATED)

Guin soils (undifferentiated) include patches of Ruston fine sandy loam, Norfolk fine sand, Norfolk fine sandy loam, Orangeburg fine sandy loam, Susquehanna clay, and Susquehanna fine sandy loam so intricately mixed that no soil type could be separated on a small-scale map. There are also inclusions of calcareous material, as in sections 8 and 9 east of Strata. The areas here consist of deeply eroded calcareous formations on which the overlying sandy materials remain as a capping on many of the ridges. The basal parts of the slopes and some of the lower divides are an eroded phase of Sumter clay.

Guin soils (undifferentiated) occur on the strata ridge in the southern part of the county. The largest areas are west and southwest of Ramer. Other areas occur on the northern escarpment of the ridge north of Pine Level.

Areas of the Guin soils (undifferentiated) consist of a series of rough broken hills and deeply eroded land. The streams have cut deep and very narrow valleys, and erosion is responsible for the broken relief and the extremely mixed or varied character of the surface soil. Drainage is excessive, and erosion is still very active. It is practically impossible to reclaim this land for agriculture at reasonable cost. It is better suited to forestry than to use as pasture land.

The greater part of the Guin soils (undifferentiated) is now forested with longleaf, shortleaf, and rosemary pines, together with oaks, hickory, and other hardwoods. Much of the merchantable timber has been removed, but the land has reseeded to a second growth of these trees. The value of the land is determined by the quantity and character of the merchantable timber now standing.

MEADOW

Meadow includes material in the first bottoms which is so variable in color, texture, and structure that no type name could be assigned to it. It ranges in color from light gray, through reddish gray, to dark gray; in texture from sand, fine sand, or fine sandy loam, to clay loam or clay; and in consistence from loose to compact.

Meadow land is extensive in Montgomery County. It occurs in long narrow strips along practically every branch and small creek in the southern part of the county. It occupies the first bottoms and represents material which has been recently washed from the surrounding uplands and deposited along the streams at times of heavy rainfall. It is subject to frequent overflows, as much of it lies only a foot or two above the normal water level of the streams. A large part of it is saturated with water during the greater part of the year.

Very little of the meadow is cleared and used for crop production. On the cleared patches sugarcane and corn are grown, with fairly good results. The chief value of meadow is to supply summer pasturage for cattle. The forest growth consists of sweetgum, together with bay, some oak, hickory, and shortleaf pine.

Much of this land could be drained and reclaimed for cropping by straightening and deepening the stream channels, by cutting lateral ditches, and by cutting a ditch at the base of the slope of the upland to take care of seepage waters. When this is done some of the meadow will produce good yields of sugarcane, sorgo, corn, and hay.

SUMMARY

Montgomery County is in the south-central part of Alabama, and the city of Montgomery is the capital of the State. The county has excellent transportation facilities and a good system of county roads. The surface relief is varied, but the greater part of the land lies favorably for agriculture and the use of improved machinery. Drainage is generally good.

The climate is characterized by mild winters and long hot summers, with an average frost-free season of 247 days. The mean annual rainfall is 51.16 inches.

The principal crops are cotton, corn, and hay. Cotton is grown on the sandy soils, and practically all the hay is grown on the prairie soils and other heavy soils. Most of the corn is produced on the first-bottom soils or lowlands. Minor crops are oats, peanuts, peas, velvetbeans, sorgho, sugarcane, and potatoes. Dairying is becoming of considerable importance in the prairie section of the county.

In Montgomery County, 29 soil types and 7 phases, representing 21 soil series and, in addition, 2 classifications of miscellaneous materials, have been mapped. These may be broadly placed in four groups, as follows: (1) The prairie and semiprairie soils, which include the Houston, Sumter, Oktibbeha, Bell, and Susquehanna soils; (2) the greater part of the sandy loam soils, including the Orangeburg, Greenville, Amite, Cahaba, Norfolk, Kirvin, and Ruston soils; (3) the first-bottom lands, such as the Congaree, Catalpa, and Ochlockonee soils; and (4) the hilly phases of soils, Guin soils (undifferentiated), and meadow. All soils of the last group except meadow are too rolling and broken for profitable farming and are best suited to forestry. Meadow is used mainly for pasture.

Soils of the first group include the heavy clay lands of the county and are devoted to the production of alfalfa, Johnson grass, oats, and pasture grasses. Those of the second group are the best cotton soils, especially under boll-weevil conditions, and are used for practically every cultivated crop common to the county. They are well suited to pecans, peaches, and truck crops. Soils of the third group are naturally heavy and very fertile, and where properly handled they return large yields of corn and hay.

Montgomery County offers excellent opportunities in soils, climate, and cheapness of lands to the home seeker.

[PUBLIC RESOLUTION—No. 9]

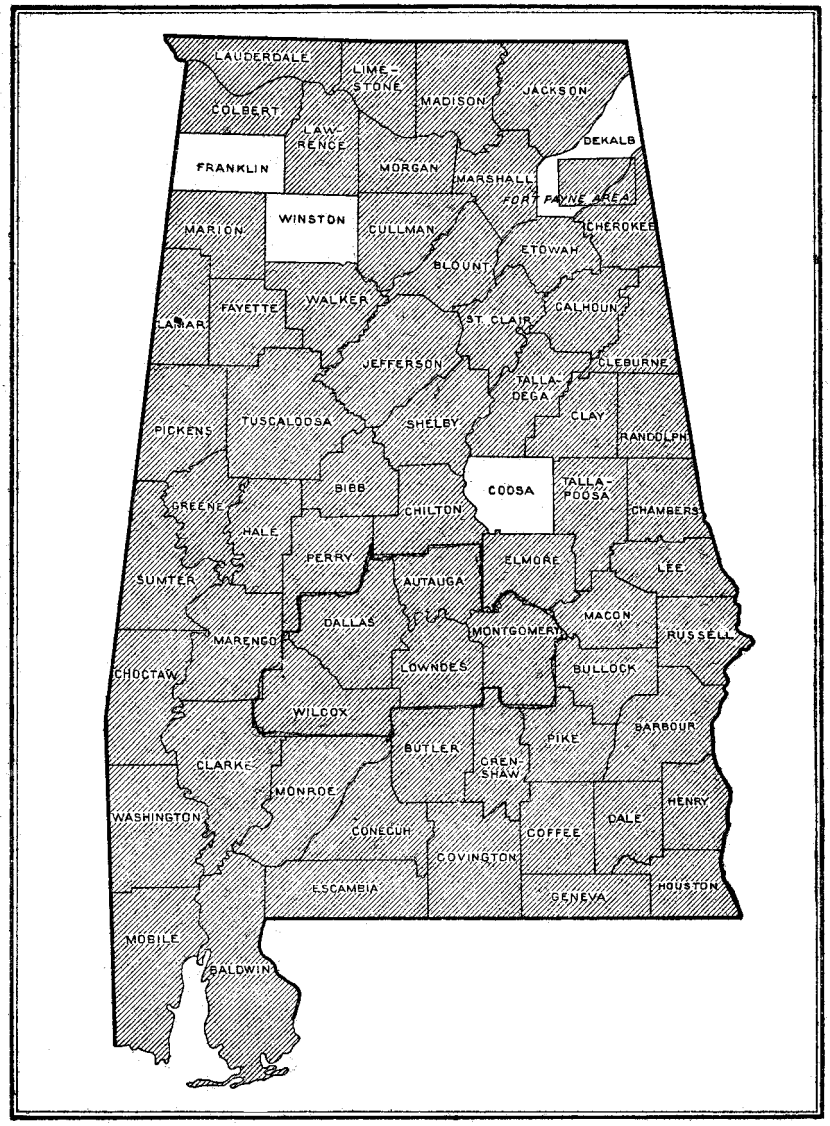
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

"That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided,* That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture."

Approved, March 4, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils, and on July 1, 1927, the Bureau of Soils became a unit of the Bureau of Chemistry and Soils.]



Areas surveyed in Alabama, shown by shading

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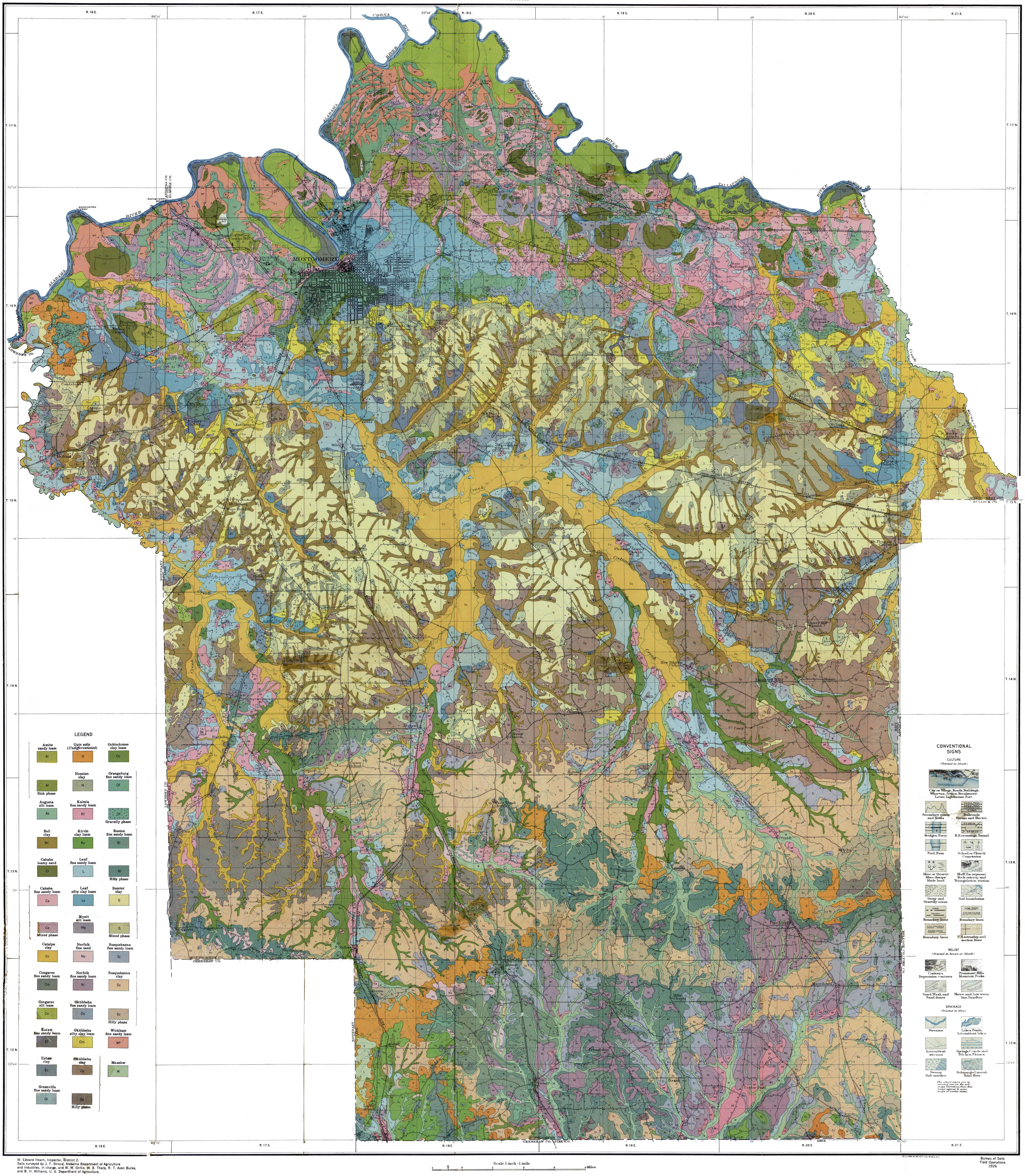
U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF CHEMISTRY AND SOILS
HENRY G. KNIGHT, CHIEF
A. G. McCALL, CHIEF, SOIL INVESTIGATIONS
CURTIS F. MARBUT, IN CHARGE SOIL SURVEY

SOIL MAP
MONTGOMERY COUNTY
ALABAMA

ALABAMA DEPARTMENT OF AGRICULTURE
AND INDUSTRIES
S. M. DUNWOODY, COMMISSIONER



W. Edward Hearn, Inspector, District 2.
Soils surveyed by J. F. Stroud, Alabama Department of Agriculture and Industries, in charge, and W. W. Strike, W. E. Tharp, R. T. Avon Burke, and B. H. Williams, U. S. Department of Agriculture.

Scale 1 inch - 1 mile

Bureau of Soils
Field Operations
1926